Pests

AND THEIR CONTROL

1941
APRIL
VOL. 9 NO. 4

ORGAN OF THE PEST CONTROL INDUSTRY

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Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

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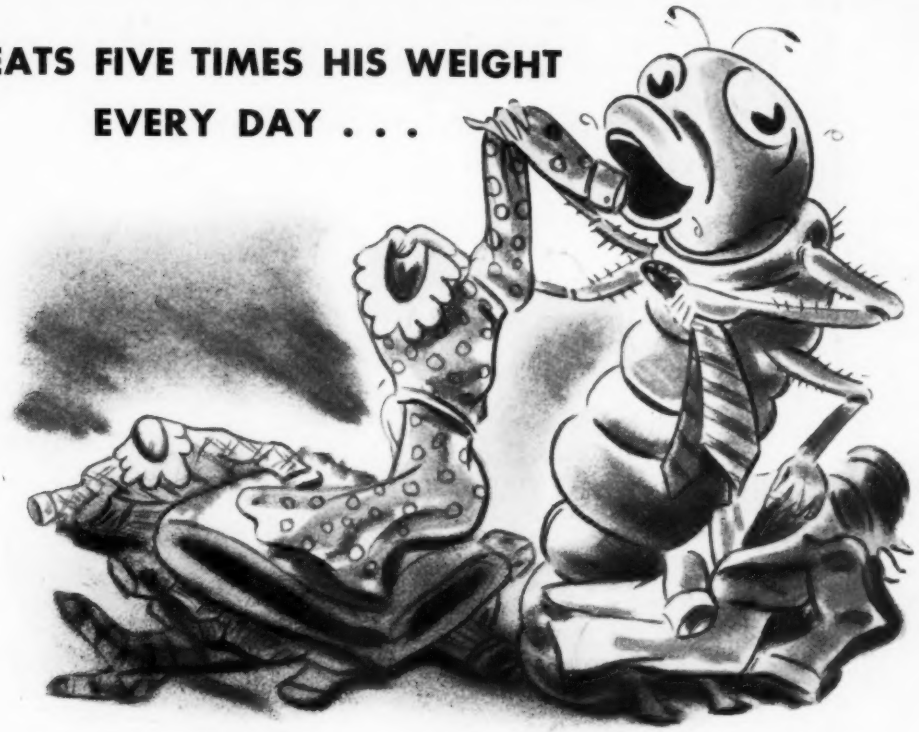

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Pests

and Their **CONTROL**

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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PUBLICATION OFFICE, 512 EAST 14th ST., KANSAS CITY, MO.

VOL. 9, NO. 4 | APRIL, 1941 | ESTABLISHED 1933

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STATEMENT

The National Association appreciates the co-operation given by way of publicity. The Association is not responsible for articles published unless credited to the Association. The list of officers and directors is published for informational purposes only.

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Published monthly by PESTS, 512 East 14th Street, Kansas City, Missouri. Subscription rate in the United States and Possessions $3.00 per year; Foreign $3.50 per year; Single Copies 25 cents; Bundles of 25 Copies $5.00. Publishers not responsible for unsolicited manuscripts. No manuscripts will be returned. All advertising copy and contributions must be in our hands by the 15th of the preceding month of the issue in which they are to appear. Three weeks' advance notice necessary for change of address. Both old and new address must be given.

EDITORIAL

Writer Deprecates P.C.O.'s

IN A COURSE on Restaurant Management at Northwestern University, Chicago, we understand there is a recommended text-book, RESTAURANT MANAGEMENT PRINCIPLES AND PRACTICE, in which its author, J. O. Dahl, Editorial Director "RESTAURANT MANAGEMENT" postulates:

> *"Do not depend on exterminating companies whose work is seldom efficient."*

He then imparts this bit of advice:

> *"The best method is to delegate this job to some one man or woman in your organization and have the work done regularly, once or twice a week, as is necessary."*

To be sure, every line of endeavor from authoring to that of zoologist has its minimum quota of quacks. To conclude, therefore, that all people engaged in such lines are of like character is patently fallacious. It is like a boy who reaches into a barrel of apples, withdraws the only rotten apple therein, and then assumes that all the apples are bad. Or as if we were to think that because the author's tome contains one or two inaccurate observations, the balance of the book is similarly so without a thoroughgoing examination of everything else he has written.

To this corner, it does not seem as if author Dahl made an objective study of the verities in the case, for if he had, he would have discovered there are thousands of restaurants, hotels, hospitals, food distributors, etc., who have for many, many years availed themselves of the efficient services of P.C.O.'s. If Mr. Dahl's industry stricture were true, it would almost follow that all proprietors or managers of establishments so serviced were business blind. Merely to state it in this way, we think should be sufficient to refute his unwarranted and doubtlessly unintended implication.

Proper investigation would also have disclosed to Mr. Dahl the growing recognition and respect accorded the industry in general and the N.P.C.A. in particular, by such reputable agencies as the Department of Agriculture at Washington, the leading insecticide manufacturers, and the entomological departments of universities, several of which have already provided short courses for P.C.O.'s, thereby permitting post graduate training on a par with other recognized professions. This industry recognition is no mere happenstance, but is deeply rooted in the public welfare because of health, economic and defense imperatives. These in turn make it mandatory that pest control measures, to be adequate, must be on a scientific basis.

Instances where P.C.O. services are inferior are generally due to a short-sighted policy on the part of certain restaurant managers who are largely price buyers. In addition they usually know nothing (and why should they) about exterminating services, and therefore, would be even less qualified to delegate inexperienced men of their own employ to handle materials that may cause sickness and even death because of the toxic nature of what may be used at times in pest control operations.

In fine, where there is no genuine effort or desire to purchase honest and legitimate services the very abuses to which the author, as well as the pest control industry, objects are brought about. Conscious of its responsibilities, the pest control industry through the good offices of the N.P.C.A. has been wrestling with the problem of improving such maverick situations. We deplore, therefore, seeing such "monkey-wrench" statements as the author's appearing in print because they are as unfair to the industry as they are to his integrity as a writer.

By Way of Explanation—

APROPOS editorial, COMMERCIAL RAT CONTROL SERVICE, which appeared in February PESTS, one of our readers, for whose industry-spirit we are grateful, writes in substance that omission therein was made of calcium cyanide as a proper method of rat control.

In mitigation, and in order "to scrape the snow from the windshield," may we point out that the editorial in question was not intended as a categorical expository of all forms of rat control extant, but rather of certain phases of it. Nor was it implicit that because certain worthwhile ones were not indicated, such were either non-effective nor even non-existent. That calcium cyanide has its just place in any proper system of rat control is indubitable. If any contrary impression was noted, it was not so intended.

Once again attention is drawn to the fact that the columns of PESTS are open to all as an industry-forum for the discussion of topics of relevant concern.

"Advances In Entomology"

The January 25, 1941, News Edition-American Chemical Society, carries a 12 page illustrated article by C. H. Richardson, Iowa State College, Ames, Iowa, covering a digest of "Advances in Entomology." The subjects covered are: Stomach Poisons; Control of Termites and Other Wood Infesting Insects; Insects of Plant Origin; Wetting and Spreading of Sprays; Fumigants; Attractants and Repellents; Methods for Testing Insecticides and Evaluating Toxological Data; Reviews; New Books; Literature Cited. Of the last mentioned there are 178 indicated, which, we think, is something of a record. Readers interested in obtaining edition containing complete article may do so on payment of 15c addressed to American Chemical Society, Mills Building, Washington, D. C.

"British Drop Potato Bugs on Germany, Nazi Claim." Yes, but s'pose they had dropped jitterbugs instead.—By Ed Scanlon.

Ethical Pest Control—Exterminate or Fumigate?

THE only reason for the existence of the ethical pest control operator, irrespective of what other name label he may assume, is to render a pest control service performed with tailor-made exactitude and suiting the precise needs of his client.

What constitutes ethical pest control? In our opinion, it means checking the client's premises carefully, ascertaining his complete requirements, and then taking care of such needs in the most efficient and economical manner possible. If powder or spray will do the work, we should not frighten the client into a fumigation in the interest of making more money. If a fumigation is called for, we should not take up valuable time and collect his money for service with powders and sprays when we know they will not produce satisfactory pest control.

Let us consider a few examples. Mrs. Sylvanus Bottomley lives in one of the better sections of town, has a well built house, and is proud of her station in society. The cook has announced in a voice little above a whisper that "there's bugs in the kitchen around the sink." Mrs. Bottomley is horrified and calls in a pest control operator. She got his name by thumbing through the telephone directory and taking the first that she found located near by. This operator looks the situation over, and diagnoses the trouble as silver-fish. But Mrs. Bottomley living in the best section of town, he feels is his fair prey to make extra profits if he can. He describes in detail the untold damage silver-fish can cause, not to mention the social stigma of having "bugs," and recommends fumigation. Mrs. Bottomley is anxious to get the work done and over with as soon as possible, and BUT MAN X gets the job. He completes the job and collects his money. But suppose this client gets a new supply of silver-fish within a few days or weeks. Result—the fumigator has a complaining client on his hands. She may investigate through reliable sources and find that a fumigation was not necessary. That means loss of a client, the type of client who could have turned further business the way of the fumigator, had he handled her problem ethically.

Mrs. John Jones is a newlywed and she and Mr. Jones have moved into their first apartment. It's one of those old mansions converted into small apartments, and has a lot of possibilities for demonstrating Mrs. Jones' knack for interior decorating. However, the first week, she finds "unwelcome guests" in her bedroom. She immediately complains to her landlord, who calls in his regular exterminator. This operator believes in the potency of his potions and powders. He looks over the situation. The bedbugs have been imbedded in the walls for several generations, and though his semi-monthly service calls have failed to remedy the trouble, he tells the landlord not to worry—for a few dollars extra he can drench the room with liquid, and he will have no more trouble. That procedure is followed, but within ten days Mrs. Jones finds her little troubles are still with her. She calls it again to the attention of her landlord. This goes on for six months, and finally Mrs. Jones breaks her lease and moves out in disgust. And so another client is lost. One fumigation with gas would probably have cleared up the trouble. The tenant would have been satisfied and the exterminator would have made his profit (or commission) on the job.

The pest control industry may be likened to the medical profession. The family doctor is the man to call when Johnnie cuts his foot, or Mary has a cold. But when the trouble becomes more serious, the family doctor himself is the first one to suggest calling in a specialist. So it is or should be with the pest control industry. When spraying service is required, the exterminator is the man for the job. But when his pest control service is limited to powder and sprays only, he should not deprive his client of the advantages of more effective service. In every city there are reliable fumigators who will take over the fumigations of other pest control operators not equipped to supply that service. Such work is handled in confidence, and ethically, with no attempt on the fumigator's part to take that contract away from the exterminator. On the other hand, if the fumigator is a specialist and does that type of work only, he in turn should turn over any work that does not call for a fumigation to his colleagues in that city who are equipped to take care of the client's particular needs.

Only when we are well on the way to reaching this goal will we as a city, state or national group, enjoy the confidence of the public, and live up to our present cognomen—"PEST CONTROL OPERATORS."

A Reminder

ELSEWHERE in this issue appears an article by Mr. J. M. Miller, J. M. Miller Pest Control System, on "WHY A CHARGE FOR TERMITE INSPECTIONS SHOULD BE MADE." This is the second of a series of articles on Proper Public Relations for the Pest Control Industry, the first having appeared in our March issue. Mr. Miller's views based on an amplitude of experience cover a much mooted phase of the industry. You will find his paper timely — meaty — pointed. It is, therefore, recommended to you for careful study and possible use in any contemplated sales promotional effort.

Reprints of this as well as other Public Relations articles are available at nominal cost. Further particulars, if you wish.

We Modestly Take a Bow

And who wouldn't. The California Pest Control Monthly Bulletin published by members of the California Pest Control Association, Inc., kindly takes time out to write about us in this vein:

> "PESTS, which by the way is always extremely liberal in space devoted to notes on the activities of the California Pest Control Association, Inc., will be found a **valuable addition to the reading matter** of all operators."

Thanks a million fellows. We sure do enjoy reading about and quoting from your very much alive Association activities. Your regular "contribs" will help us to further merit the advice you give your membership.

Corrections—March Issue

Editorial—Page 4—"THE RESTAURANTEUR AIDS THE P.C.O." should have read "THE RESTAURATEUR AIDS THE P.C.O."

Editorial—Page 4—The sentence, "Or if you prefer, we will grant permission for photo offset reprints through your local facilities providing 'credit line'", should have read, "Or if you prefer, we will grant permission for photo offset reprints through your local facilities providing 'credit line' is given."

Article FUNDAMENTALS OF ADVERTISING—Page 16—Editor's Note—Third sentence starts with word "inimicable" which should of course have read "inimitable."

PUBLIC RELATIONS

Why a Charge for Termite Inspections Should Be Made

By J. M. MILLER, *J. M. Miller Pest Control System, Hollywood, California*

A Much Needed Service

HOW is a property owner to know if there are termites destroying his building and what damage has been done?

The only answer to this question is to have some one who has a thorough knowledge of termites, their traits and habits, and who is capable, through his construction knowledge and experience, to detect the weakened parts of the structure and to determine how to correct them so as to make the structure again safe for occupancy by making a complete inspection of the property. The information one assembles through inspection of a property is professional and one should be compensated for such service, the same as a doctor is when he diagnoses your physical condition. You would not expect your physician to render such a service free of charge—and yet, he does not assume the risk in his professional service that the pest control operator does when he inspects a building for termites and wood-destroying agencies.

Dangers Encountered

Did you ever stop to think of the risks of danger that one takes in making a proper termite inspection? One may fall from the attic, or roof, or through the plaster of the ceiling; or may scratch or injure various parts of the body on protruding nails and metals; or get bitten by some insect or spider, and many other conditions too numerous herein to mention. Is it fair that one should assume this risk without some compensation to cover it?

Is It a Pleasure or Hard Work?

Would you ever consider it a pleaure to crawl on your stomach over rubbish, wood and building leavings filled with rusty nails, tin, and glass, fighting cockroaches, spiders and various other insects in order to satisfy the curiosity of a tenant, prospective purchaser, or property owner? Making a charge for an inspection stops the curiosity seeker from wasting your time and money.

No Standard Specification

Because of the fact that all structures are not built alike the necessary repairs, improvements and corrections would likely be different in each structure, and because the infestations are seldom, if ever, the same, it becomes necessary for one to draw up a separate specification, correction and control method for every structure inspected. Therefore the acquired information is very important to the owner. Is it not worth the price of an inspection for the owner to receive such a report and knowledge of the property?

Overhead Expenses of Making an Inspection

To make an inspection it is necessary for one to travel to and from the property to be inspected—time, gasoline and oil are consumed; the wear upon the car, equipment and clothing; the time spent in making a thorough inspection of the property; the parts of the structure one may damage in proper inspection of the structure; the time consumed in drawing up and preparing the necessary report and specifications; the bookkeeping, clerical and telephone costs, etc., are a few of the expenses that are incurred in making termite and pest control inspections. Logically, the cost should be charged to the one that so authorized the inspection and the expenditure, and reaps the benefit of the knowledge obtained from such an inspection.

A Thorough Inspection Consumes Time

To make a thorough inspection of any building for termites one should:

(1) Be fully equipped with proper tools and apparatus, and so clothed that every exposed wooden part of the structure can be inspected.

(2) (Drywood Termites)—To look carefully for evidence (pellets), and destruction in the attic, around all wooden projections, gables, pergolas, window sills, on the ground outside near the structure, and on the ground under all wooden parts of the building.

(3) (Subterranean and Dampwood species of Termites)—To carefully examine all wooden underpinning, floor joists and floors for destruction; and the building leavings on the ground under the structure, and the ground under and around the structure for termite evidence.

(4) To make a careful and detailed report and diagram of the structure showing the location, as near as possible, of all infestations found and the damage done.

Such an inspection takes considerable time to make and therefore should be charged to the one desirous of this scientific information.

Scientific Knowledge

To make a termite inspection one should have the knowledge to:

(1) Classify the habits, traits and characteristics of all the various species of termites that may be found in the locality where the structure is situated.

(2) Describe the structural parts of a building and how to correct and replace or strengthen all materially weakened parts thereof.

(3) Comply with the building ordinances, laws and requirements which govern this class of insect--pest control work.

(4) Know the cost of labor and materials necessary for replacement and the overhead expenses incurred in the proper execution of the work.

(5) Be properly equipped to make application and to know the effects of all chemicals to be used for proper control of the found infestations.

(6) Carry proper liability, compensation and other insurances that fully protect property owner and operator.

(7) Know how to make a detailed working and control agreement for property owners which covers the cost of all repairs, improvements, corrections, preventives and necessary treatments recommended for proper control.

It takes years of preparation and study to acquire the necessary theoretical and practical knowledge, and therefore the cost of acquiring this education should be repaid in the use of it the same as with other professions.

Is It Fair to the Client?

Is it fair to the property owner who contracts with you for work to be done, to have to pay for his neighbor's inspection? This is the case where a charge is not made for each inspection as general expenses, or unpaid-for-services are unseen items that go to make up general overhead charges.

A Reasonable Charge Is Good Business

Whenever one makes a charge for a termite and fungi inspection they are "put on the spot." One must report the property owner or buyer the exact conditions of the property; he must be prepared to answer intelligently all questions; and must not falsify or misrepresent. This establishes confidence and dependability which are two of the best business assets a firm can acquire.

How to make a structural pest inspection, and the information to be assembled for estimating the control work to be done.

1. Make a general lay-out drawing approximately to scale.

a. Indicate on drawing the location of all porches, patios, wall projections, archways, pergolas, meter boxes, downspouts, etc.

b. Name each item mentioned in (a) above, or any other parts of construction connected with the house.

c. Examine each item mentioned in (a) to see if wooden parts contact the ground or dirt fills. Examine for termite infestations, fungi infections, and structural defects.

d. Inspect around all outside window sills and wooden projects, and ground under wooden siding, for drywood termite pellets. Mark infestation on diagram.

e. Inspection of the exterior of the building near foundation to determine the height of foundation above or below the grade line. Indicate the location on drawing.

f. Determine the porch construction. Note cracks, replacements, settlements, etc.

g. Mark in existing air vents (size, state if in direct contact with ground, and what materials they are covered with).

2. Inspection of the interior of the building: sagging and discolored hardwood floors; paneling; dragging doors; also inspection of bathroom and shower walls and partitions for discoloration and leaking cracks.

3. Inspection of improved basement areas for termite infestation of all types, and fungi infections; also including inspection and determination of the type of column construction, interior partitions, basement stairs, etc.

4. Inspection of attic areas for drywood termites and for other insect infestations; including inspection of roof areas for roof leaks, air vents, inaccessible areas, and necessary roof bracing.

5. Inspection of the under area for all kinds of termite and beetle infestation, and for fungi infections.

a. Inspection of porches, patios, and other dirt filled areas having concrete floor slabs, for termite infestations of all types, and for fungi infections, as well as construction defects. Make note of information acquired on diagram.

b. Note if sheathing goes down below foundation.

c. Check on foundation, stucco, and wooden parts of structure below outside grade level.

6. Recommendations: Explain in detail.

a. Improper construction, and proper methods of repairing and eliminating structural defects.

b. Estimate time necessary for clean-up work, and general preparation of the structure for treatment.

c. State conditions as to piling of repair materials, rubbish, etc., during reconstruction period.

d. Accessibility to haul away debris, etc.

A Suggested Form

Inspection No. ..... Date....., 1941
Owner.....Street.....City.....
Property located at.....City.....
Purpose for which inspection was made.....
Kind of infestation.....

INDEX TO DIAGRAM OF STRUCTURE—MARK LOCATION ON DIAGRAM

S—Sub. Termites.
D—Drywood Termites in attic.
d—Drywood Termites in underpinning.
F—Fungi.
G—Gophers
B—Powder Post Beetle.
V—Vent.
p—Cement piers.
IB—Ice Box.
WL—Water leaks.
C—Cement porch floor.
W—Wood porch floor.
DS—Location of drain spouts.
NV—New vents.

1. Description of property.....Age.....
Built of:
Frame.....Stucco.....
Shakes.....Brick Veneer.....
Shingles.....Brick.....
Siding.....Cor. Iron.....
H. Tile.....Board.....
Magnesite.....Plaster.....

2. FOUNDATION O.K. ( )
Cement.....Below grade.....
Brick.....Above grade.....
Wood.....Even with grade.....
W. piers.....Condition.....

3. PORCHES & STEPS O.K. ( )
No.....Repairs.....
Cement.....Replace.....
Wood.....Ground contact.....
Dirt fill.....Sealoff.....

4. VENTS O.K. ( )
Lattice.....Enlarge.....
Mesh.....Install.....
Fine screen.....Repairs.....
Curb vents.....Touch ground.....

5. GROUND CONTACT O.K. ( )
Projections.....Siding.....
Underpinning.....Patio walls.....
Fences.....Pergolas.....
Posts.....Piers.....

6. CHIMNEY O.K. ( )
Brick.....Stone.....
Wood.....False.....
Settled.....Cracked.....

7. JOISTS O.K. ( )
Distance from ground.....
Inches apart.....Size.....

8. ATTIC O.K. ( )
Inaccessible.....No opening.....
Remarks: .....

9. ROOF O.K. ( )
Composition.....Tile.....
Shingles.....Roof leaks.....

10. EXTERIOR O.K. ( )
Fish or lily ponds.....
Shrubbery close to bldg.....
Need painting.....

11. UNDER AREA O.K. ( )
Inaccessible.....Excavate.....
Water leaks.....Dry.....Wet.....
Kind of soil.....

12. INTERIOR O.K. ( )
Floor out of level.....
Walls: Fair.....Good.....Cracked.....
Shower: Tile.....Plaster.....

13. PIERS O.K. ( )
Concrete.....Brick.....
Settled.....Wedge piers.....
Above grade.....Below grade.....
Install.....Repair.....

14. Amount of debris.....Time required.....

15. Is there a place on lot to store debris and building materials.....

16. Is there a place accessible to truck.....
.....

17. Remarks.....
.....

18. Name of tenant.....

Tenant's phone number.....

Date.....

Time consumed in making inspection
.....

Inspected by.....

—Cartoon Courtesy Fuld Bros.

Ants and Their Control

By J. E. ECKERT, *University of California*

EDITOR'S NOTE: *The following paper was given by J. E. Eckert at the Fourth Annual Pacific Coast P. C. O. Conference at University of California, February 20, 1941.*

ANTS are, without a doubt, one of the most common pests with which man has to deal in both the field and the home. They have been with us, in one form or another, from the beginning of time and judging by past experiences in attempts at their eradication, they seem destined to be with us until the end of time.

The ant kingdom is marvelously adapted to survive even under the most adverse conditions and given an even break in environmental factors they often multiply in unbelievable numbers within a short time. Ants have reduced their requirements to a minimum, and have adopted a migratory system of living that makes it possible for them to change their environment to suit their immediate needs. They require the simplest of materials for their nests and their requirements for suitable nesting sites are sufficiently broad as to make the most of general surroundings that approximate their wants. They can control temperature and moisture by simply taking advantage of soil conditions and such other factors as depth of soil, shade and soil coverings, such as stones, wood, masonry and vegetation.

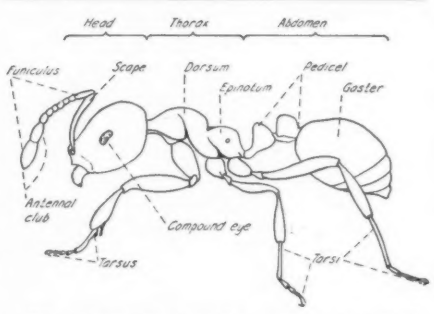
Man has immeasurably improved the chance of the ants to survive by providing them with additional shelters, which we call our homes and place of business, and by furnishing them with additional food supply in the nature of large plantings and in the various processed foods made therefrom.

But our purpose at this time is not to extol the virtues of ants or to admire their ability to circumvent our attempts to eradicate them, but rather to study ways and means of making our efforts at control more effective. So we might as well get down to the fundamentals of ant control.

In the first place, in order to know how to control ants, it is necessary to identify them either by their physical appearance or by their behavior, food requirements and nesting habits. Our task is simplified by the fact that there are relatively few species of ants that can be considered as definite pests of the home and immediate surroundings, only about 18 to be exact, and of these, several are only occasional pests of the farm and home.

The general appearance of ants of different species is sufficiently similar for one to distinguish this form of insect from those of other groups. Not many insects are wrongly mistaken for ants except the termite, commonly termed the white ant, and this likeness is only superficial. The termite does not have the wasp-like construction of the abdomen that is so typical of ants. A close study under a microscope of the anatomy of a typical ant, and a comparison of certain physical characters of different species will soon enable one to distinguish between our most destructive forms. Wheeler, Smith and other ant specialists have erected keys by means of which the various species of ants can be identified. It simplifies matters in describing ants to know the essential structures and to designate ants by name in making recommendations for their control.

Most ants have characteristic foraging and feeding habits that once learned soon lead to their recognition. The relative size, shape and color of the different forms also aids in identifying an ant frequently without the aid of a microscope. The various species also have typical nesting places and characteristic habits of nest construction, the external appearance of which aids materially in identifying the species. And further, the food requirements of ants are sufficiently limited that one can generally determine the best of several methods of controlling their depredations if one once discovers the identity of the offending species.



Diagrammatic drawings of an ant indicating the important structures usually used in the description of different species.

The various stages in the development of ants are very much alike in the different species and are similar to those of other Hymenoptera. The eggs are very small, seldom exceeding 0.5 mm. in size, and vary in shape from spherical to eliptical. The larvae hatch as soft, legless and helpless grubs generally shaped like a crook necked squash or gourd with a broad, straight posterior and a narrowing, curved anterior end that terminates in a small head. The larval body is divided into 13 more or less distinctly marked segments. No traces of eyes or legs are present. The larval body is generally covered with hairs of varying lengths, according to the species, although some larvae are entirely naked. The hairs protect the delicate integument from injury when the larvae are carried by the adults and serve other functions as well. The larvae are fed on either regurgitated food or on solid food, or a combination of both, according to the species. At the conclusion of the larval feeding period, the larvae of some species spin cocoons while in others the adult larva passes into the semipupa stage after discharging the meconium or waste products of digestion during the larval period. Those spinning cocoons pass the entire prepupal and pupal periods within a cocoon of silk spun during the last period of the larval stage.

The length of the different stages in the embryonic, larval and pupal life of ants is quite variable and is closely correlated with temperature. Janet found the embryonic period of *Myrmica rubra* to be 23 to 24 days, the larval period 30 to 71 days and the pupal period 18 to 22 days, or a total elapsed time of from 71 to 117 days. This is a comparatively long period of development and as stated, the duration depends on temperature conditions. It is possible that the period of development during the summer months is somewhat shorter, although ants can control the temperature conditions surrounding their brood by transporting the different forms from one favorable location to another.

While the developmental period is long, the duration of the life of the individual ant is still more striking

and remarkable. Worker ants have been known to live for five or six years and queens have been kept for nine and ten years and one record of 15 years was noted by Lubbock in 1888 for *Formica fusca*. Is it any wonder, then, that colonies of ants can become so populous, especially when each colony may have a number of queens producing eggs at the same time?

Ants have also been found to be highly resistant to adverse conditions. Workers and queens can go without food for months at a time and both the adult and immature forms can withstand freezing temperatures, and submergence under water for days at a time. Ants appear soon after flood waters recede, or the snows of winter melt away or even after the ground cools from a fire that is intense enough to destroy all vegetation. If exposed to a temperature of 35° C. (96° F.) ants show signs of distress and at higher temperatures soon succumb. They avoid such temperatures by seeking shady places during the heat of the day or remain under cover or in their nests in the ground until more favorable conditions prevail. From these facts it is quite evident that the ant is highly tenacious of life, remarkably adapted to survive the various perils that naturally beset it, and to effect a control one must consider it a foe that is worthy of all the ingenuity that can be brought to bear on the different problems involved.

The Commoner Ants in California

The species of ants that are more commonly listed as house and garden pests are as follows:

1. Argentine ant, **Iridomyrmex humilis,** a small brownish, sweets-loving ant that travels in trails and typically nests in the ground. From one to a dozen or more queens may be found in each nest which not infrequently occur close together along the trails traveled by the ants in search of their food supply.

2. Odorous house ant, **Tapinoma sessile,** a small black sweets-loving ant that travels in trails and nests in crevices between the walls, sills or floors, in cavities of trees or in the ground.

3. Western thief ant, **Solenopsis molesta,** var. **validiuscula,** very tiny, yellowish, fat and protein-loving ants. These also travel in trails. The antenna has a 2-segmented club. Their small size and color as well as their slow motion, makes them difficult to see, especially on varnished surfaces. More commonly it nests in the soil.

4. Pharoah's ant, or the little red ant, **Monomorium pharaonis,** a reddish-yellow, tiny ant that feeds readily on sweets or fats. Antenna has a 3-segmented club. It is not as common in the West as in the eastern portion of the United States. Its nests may occur in the walls or floors of houses or in the garden or lawn.

5. California fire ant, **Solenopsis xyloni** var. **maniosa.** Varies in size from 1.5 to 5.8 mm., with a reddish-yellow head and thorax and black abdomen. Feeds on a variety of substances, including nuts, oatmeal, seeds and meats. Commonly nests in the soil in the lawn or garden or along curbs, walks and foundation of buildings. Often constitutes a serious pest of greenhouses. Known to attack and kill baby chicks and game birds just after the eggs are pipped.

6. California velvety tree ant, **Liometopum apiculatum occidentale,** a fairly large ant, 2.5 to 6 mm. in length, having a glistening black abdomen, a red thorax and a brownish-black head. They travel in trails in search of food and commonly nest in decayed portions of trees. They pro-

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duce a very pungent odor when crushed. They may travel a hundred yards or more from their nest in search of food. They feed on insects and sweets.

7. Tiny black ant, **Monomorium minimum,** a tiny black ant that at times invades dwellings from their nests in the lawn, or beneath rocks, in search of sweets and greases.

8. California honey ant, **Prenolepis imparis,** var. **californica.** A shiny, brownish-black ant with a somewhat triangular abdomen. It commonly nests in the ground, under stones or pieces of wood and may invade the home for sweets. It is one ant that can survive in the same vicinity as the Argentine ant. It tends plant lice and its chief source of food is honeydew which the aphids produce.

9. Field ants of the genus **Formica.** The California brown field ants, **F. cinerea,** with their subspecies and varieties, commonly nest in cracks of the sidewalk and along the foundation of buildings from which they not infrequently invade dwellings. The red and black **F. rufibarbis,** var. **occidua,** has similar habits and is a more frequent pest of the garden than in the home.

10. Carpenter ants, **Camponotus** sp. are large ants from 6 to 13 mm. in size which frequently become pests in foothill and mountain regions by their habit of tunneling in the joists and timbers of dwellings, especially log houses and by the sawdust that drops from the peek holes in the side of their tunnels as well as their presence in the home.

11. Agricultural or harvester ants, genus **Pogonomyrmex.** Nest in areas which they clear of plant growth. They are usually yellow to reddish-yellow in color and while rarely a pest of the household, they are of considerable importance in the field and garden.

12. Agricultural or harvester ants, genus **Veromessor.** Usually black or reddish-black in color and have similar nesting habits to the California Agricultural ant.

13. Pavement ant, **Tetramorium caespitum,** a medium sized, slow moving blackish-brown ant having the head and thorax furrowed with parallel lines. Nest under stones or pavements and in lawns. While it is a potential household pest, it is of greater economic importance agriculturally through its destruction of various plants by eating away the outer bark and cambium layers. It has been known to kill various hedge plants, daisies, and strawberry plants.

14. **The pyramid ant, Dorymyrmex pyramicus.** A small ant, 1.5 to 2.0 mm. in length with a reddish-black head and thorax and a black abdomen. The pyramid-like projection of the posterior portion of the thorax is distinctive. Nests predominately in vegetation-free areas and at times invades dwellings.

15. **The acrobat ant, Crematogaster** spp. Of little economic importance. Occur commonly under rocks and when disturbed have the habit of turning the heart-shaped abdomen over the thorax. They tend plant lice and feed on honeydew from aphids and coccids.

16. Black field ant, **Lasius** spp. Of little economic importance in California although they tend aphids in cultivated fields. At times they invade dwellings for sweets.

17. **The big-headed ant,** genus **Pheidole,** live in situations similar to the California fire ant from which they can be distinguished by their 12-jointed antennae and 3-jointed antennal club. Feed on nuts and seeds and at times are destructive in seed beds and green houses.

18. The leaf-cutting ant, **Atta versicolor pergande.** Only one species of the leaf-cutting, fungus-growing ant of the genus **Atta** is reported in California. It is not common and is of little economic importance.

Control Measures

In the control of ants, the most important factor is that of **cleanliness.** The ant colony is so organized that it has scouts out continually seeking sources of food supply. As soon as any of these scouts locate food material, they carry it back to their nests and convey the knowledge of its presence to other members of their colony. Consequently, if food materials are kept in ant-proof containers, if the supper dishes are not left over night and sinks are kept clean, the nearby ant colonies will have less grounds on which to invade the home.

The second important factor is that of **persistence** in using control measures. The inmates of a colony run into the thousands with new hordes being produced daily. It may take only days but generally occupies weeks of time to reduce a colony by the use of poison baits until it is no longer troublesome. The individuals that have found a bait can may all be killed off within a short time and if the can is not moved to other trails, the balance of the colony may not find the poison bait at all.

Chemical means of control are generally divided into three categories; arsenicals in sugar syrup for sweets-loving ants, arsenicals in fatty compounds for those ants which feed on fatty substances, and the use of contact poisons and fumigants.

Poison baits, if attractive to ants and if they are kept where the ants can find them, are most effective when the foraging ants carry the poisonous materials back to their nests and there feed them to the queens. Poison baits should be placed outside of the kitchen or home and especially out of reach of domestic animals and the inquisitive hands of children. Poison containers should be very carefully labeled.

Contact poisons, such as fly sprays which include a volatile oil carrying extracts of pyrethrum or rotenone (or both) kill only those ants they cover and are useful in temporarily ridding a place of ants. Such sprays serve a very useful purpose in killing Argentine ants that are moving their queens and young following a rain or the irrigation of the garden and also at the swarming time of other ant colonies. At such times, a number of queens are killed.

Pyrethrum and derris powders are also very effective in killing ants with which they come in contact and also in keeping ants from entering through cracks and crevices.

Soil fumigants are most effective of all measures if used properly to kill out the entire inmates of a nest and this method should be encouraged wherever it is practical.

Newly Found Fly Spins Web, Traps, Eats Spiders

PHILADELPHIA.—A newly discovered fly that spins a web for catching spiders and other insects was described before the meeting of the Entomological Society of America recently by Dr. B. B. Fulton, research entomologist of North Carolina State College.

The fly, strangely enough plays its spider-like role only when it is still in the larva stage, when it looks very much like a small worm. At that time the larva devours small spiders and other prey caught in its web.

When it grows up and becomes a fully developed winged adult it becomes a mild vegetarian, feeding harmlessly on mushrooms, Dr. Fulton reported. The species has been named platyura fultoni in honor of Dr. Fulton, by its discoverer, Dr. Elizabeth Fisher, a fellow entomologist.

The incredible insect is luminous like a firefly or glow worm; only it goes the firefly one better by carrying lights both fore and aft. Its front segment and its five rear segments shine with a weird blue light.

—*New York Times.*

TERMITES

Information from Arkansas State Plant Board

"We have had a great many complaints about termite operators, and it seems that the only solution is a strong law with real teeth," wrote the Better Business Bureau of a large city in a neighboring state, requesting information about the Arkansas law which requires the licensing of termite operators by the State Plant Board.

The purpose of the Arkansas law, which went into effect July 1, 1939, is to eliminate the incompetent or fraudulent termite operator who render little or no service in return for the money paid to him by the property owner.

Inspection Essential

One of the things learned by the Board, during its first year's experience in administering the law, was that little is accomplished by such legislation unless it is backed up by inspection. The Board now requires all termite operators at the end of each month, to turn in a list of houses which they have treated, so that during the following month inspections may be made of as many of these as possible.

The Board can thus determine how well the work is being done, can require that work found defective be immediately made good, and can cancel the license of any operator whose work is found consistently sub-standard. Of the 1,200 houses treated since the law went into effect, the Board has been able to examine about one-third, and has found it necessary to require the operators to re-treat, because of failure to control the termites, in 18 per cent of these cases. As the operation of the law becomes more effective this percentage should be materially reduced.

Many Calls for Inspection

An occasional property owner seems to resent the state's efforts in his behalf, and strangely enough this is most ofen the case when the termites are still found at work. One lady, when the inspector reported that termites were still active in her home, even after the operator's second attempt, wrote the Board tartly, "I have perfect confidence in his (the operator's) ability to control the termites, and am sure that he needs no assistance or advice from anyone." Usually, however, the property owner is only too glad to have the job checked over. The Board receives many requests for the service, and in several instances the householder has refused to pay the operator until the Board has examined and approved the work.

As there is no appropriation for this work, the inspections are made at odd times between other duties, by the Board's regular force.

Applicants Required to Demonstrate Ability

The Board at first required only that each applicant for a license pass an examination. More recently, in addition to the examination, the applicant is asked to demonstrate his ability by treating one or more infested houses, these to be inspected by the Board before and after treatment. Licenses expire on June 30th of each year. For the year beginning July 1st, licenses have been issued to 14 operators, at Little Rock, Pine Bluff, Texarkana, Magnolia, Searcy, Alma, and Memphis. In addition, several are operating on a probationary basis.

PAUL H. MILLAR, Chief Inspector.

TERMITE NIGHTMARE: I dreamt I dwelt in marble halls!

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Methods of Testing Insecticides Against Bedbugs and Cockroaches*

By F. L. CAMPBELL, *Ohio State University*

THE foregoing title was assigned by Professor J. J. Davis. The writer takes the liberty to modify it as follows: "Biological Tests of Liquid Household Insecticides."

Definition: A liquid household insecticide consists of a liquid (base oil) derived from petroleum in which are dissolved insecticidal liquids or solids that increase the effectiveness of the oil as a contact insecticide against household insect pests.

Purpose and Philosophy of Biological Laboratory Tests: Where chemical analyses can be made and correlated with insecticidal effect, it is best to rely on the results of chemical analyses for the evaluation of different samples. However, the composition of modern liquid household insecticides may be so complex that accurate chemical analysis is impossible or, if possible, the results in terms of insecticidal effect are obscure. It is therefore necessary to make performance tests of such liquids against insects, preferably against the species that the insecticide is intended to control.

The results of comparative laboratory tests of liquids A and B against insects will not prove that either A or B will be a satisfactory or unsatisfactory insecticide in particular cases in practice, because results in practice depend on a combination of many variable factors that cannot be duplicated in the laboratory; e. g., method of application, quantity applied and thoroughness of application, environmental conditions and extent and location of the infestation. In other words, what we think of as a good insecticide may on occasion give poor results in practice, whereas a poor insecticide may give good results at times depending on the combination of conditions just mentioned. Therefore, the laboratory test cannot tell the whole story, but it should tell us that in the long run under all sorts of conditions A will give better practical results than B, will be equivalent to B, or will be less effective than B. This, of course, is what the P.C.O. wants to know when he buys a finished insecticide or buys the oil and ingredients to make a finished insecticide. If A is shown to be better than B in a laboratory test, the buyer can conclude that A will generally be better than B in practice only if he has confidence in the logic and procedure of the laboratory method, for it is not feasible to compare A and B in practice over a sufficient period of time and variety of conditions to check the laboratory results.

The basic assumption in laboratory testing of liquid insecticides is that the effect of the insecticide on the insect depends on the quantity of the insecticide deposited on the insect's body. If, therefore, we arrange our laboratory test of A and B so that equal quantities of A and B are deposited on equal groups of insects under identical conditions and then find that A consistently kills more insects than B, we feel that we are justified in concluding that A will usually give better results in practice than B, and other things being equal (price, lack of detrimental effect on man, animals, house furnishings, etc.) we would choose to buy A.

Methods: If you were to study in detail all the methods that have been used for laboratory tests of liquid household insecticides, you would find that all of them strive for uniformity —uniform application of the insecticide under uniform conditions on uniform insects. Obviously this is done so that observed differences in effect between insecticides can be attributed solely to differences in killing power of these insecticides. While there is no difficulty in fixing uniform mechanical and environmental conditions, it is practically impossible to produce uniform insects. Not only do individual insects vary in their susceptibility to a given insecticide, but the average susceptibility of different populations or batches of insects may vary from time to time in spite of our best efforts to rear them in a uniform manner and to use insects of the same age, or sex or sex ratio. In order to minimize the disturbing effect of this inevitable biological variation we must not only use reared insects of the same age, but must always make comparative tests of our samples of insecticides versus a standard insecticide against random examples of insects from the same population. Then we should repeat these tests several times against insects from other populations or batches. For example, if we want to know the relative value of insecticides A and B versus the Official Test Insecticide of the N.A.I.D.M. we must run A, B and the O.T.I. at the same time against insects from population A, repeat against population B, again against C and so on till we are convinced that we have ironed out the random errors due to biological variability.

The differences in the mechanical features of different methods are due as a rule to the differences in point of view of the laboratory men. If the investigator feels that uniform and controlled application of the insecticide is of paramount importance, he will not try to simulate any condition of practical application, but will strive simply to lay down a definite quantity of insecticides on each insect in the most rapid, convenient and precise manner. Three general methods for doing this may be called—

(1) The Drop Test Method, in which measured droplets of insecticides are placed on the bodies of individual insects.

(2) The Settling Mist Method, in which a uniform mist of insecticide is caused to settle for a definite time upon insects confined in a small container.

(3) The Direct Spray Method, in which an insecticide is sprayed directly on insects held in a rotating cage or on a rotating rack in a ventilated chamber.

Entomologists who belong to the simulating school of thought have sacrificed accuracy and speed in order to approach as closely as possible in the laboratory to practical conditions of application. They have given us—

(1) The well-known Peet-Grady Method for housefly tests.

(2) The Lard Can Method for cockroach tests.

Of all the laboratory methods that have been proposed only the Peet-Grady Method has been generally accepted, and even this method is opposed by certain workers. It is im-

*Presented at the 5th Annual P. C. O. Conference at Purdue University.

possible here to go into the details of these tests or to discuss the merits or faults of each.

Use of Laboratory Test Results: To be most useful to buyers of liquid household insecticides the results of tests of sample X should be given not in terms of the percentage of insects that it killed in the tests but in terms of its effect relative to that of the standard insecticide which was tested at the same time. Assuming for the moment that the standard insecticide is one that generally gives fair results in practice, we should expect a good insecticide to give better results than the standard in the laboratory test. How can we express the relation between the sample and the standard to indicate not only that the sample is better but how much better? Present practice in the Peet-Grady method is to cause the standard (O.T.I.) to kill between 30 and 70 per cent of the insects (preferably about 50%). Then subtract the per cent mortality caused by the standard from that produced by the sample. For example, if the sample kills an average of 70 per cent and the standard kills 50 per cent, the difference is 20 points in favor of the sample. It has been arbitrarily agreed upon that samples killing 16 points or better above the O.T.I. shall be called grade AA insecticides and most commercial sprays are now rated grade AA against houseflies.

This is not the only way in which the value of a sample can be stated in terms of its effect relative to that of a standard. There are certain advantages in comparing the quantities of insecticides that give a certain kill instead of comparing the kills produced by a given quantity. We may, for example, determine the volumes of two insecticides required to kill 50 per cent of the insects. If 2 cc. of the standard kills 50 per cent, whereas only 1 c.c. of the sample is needed to do the same job, it is obvious that the sample is more potent than the standard in the ratio of 2:1. If we call the value of the standard 100 per cent, then the sample has a value of 200 per cent.

Regardless of the rating system used, it is now certain that the relative value of two insecticides against houseflies may be quite different against cockroaches and bedbugs. Therefore we cannot always rely on the results of a Peet-Grady test to rate a bedbug spray or a roach spray. For nearly four years work has been going on in the writer's laboratory to develop methods that commercial entomologists would be willing to adopt for tests of liquid insecticides against roaches and bedbugs. Although no crawling insect test has yet been adopted as official by the N.A.I.D.M., our settling mist method is now being used by us in connection with specifications of the Ohio Department of Public Welfare for roach and bedbug sprays. We feel that our tests have enabled the State of Ohio to buy efficient sprays for the control of these insects.

Help Needed from the P.C.O.'s: As the standard insecticide in our roach and bedbug tests we have been using the O.T.I.—the same standard used in Peet-Grady tests on houseflies. We are not sure of the status of the O.T.I. in practical control for crawling insects. Is it good, fair, or poor against roaches or bedbugs? If it is good, we need a weaker standard, if poor a stronger standard. Any P.C.O. who has or can get information on the practical performance of a 5 per cent 20:1 pyrethrum concentrate (=O.T.I.) on roaches or bedbugs can help us by giving the writer his opinions on its performance.

We also need information on the quantity of oil-base insecticides that are generally laid down in practical

(Continued on Page 31)

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The Third Annual Southern Pest Control Conference

EDITOR'S NOTE: *This is a somewhat belated article but many details that intervened made it difficult to obtain summary sooner of this successful P.C.O. Conference.*

THE Third Annual Southern Pest Control Operators' Conference held at Louisiana State University, January 27, 28 and 29 was the most successful of the three conferences held, with 88 registered for the program, representing 9 states. Others were also in attendance.

The conference was opened by Dr. O. W. Rosewall, Professor of Entomology and Chairman of the Conference, who introduced Fred Frey, Dean of Administration. Dean Frey welcomed and extended greetings from the University to the Pest Control Operators. Then followed a most interesting talk by Colonel Roy A. Hill on the subject of "The Pest Control Operator and the Army Camp." This was a timely talk; after which, Col. Hill answered many questions asked by Pest Control Operators.

The absence of William O. Buettner was felt by all those attending the Conference, but his place was ably filled by Louis Kotler, who read the three papers which discussed fumigation precautionary measures, growth of P.C.O. Industry, and National Pest Control Association policies.

The talk by Dr. W. H. Gates on "The Pest Control Operator and the Health Board" brought out the fact that the average Health Board does not recognize the Pest Control Operator because the Pest Control Operator has not made his status clear. No doubt, due to several requests, Dr. Gates will prepare a paper on the subject to be published later.

During the afternoon session of the first day Dr. J. H. Roberts discussed the mouth parts of insects, and the question of "Rats and Mice" was presented by John Hogan and M. Hull. The latter subject brought forth much discussion from the audience.

The night session was held in the Senate Room of the State Capitol on the subject of "State Legislation for the Pest Control Operator." This was the outstanding session of the Conference and was conducted by Chairman Tom Raley. After a lively discussion Louis Kotler gave a summary of the talks.

The morning of the second day was given over to "Fumigation" and was thoroughly treated by Drs. G. H. Chapman, C. L. Williams, and C. O. Eddy. "Bill" Buettner's place on the program was again filled by Louis Kotler. In the afternoon T. F. Catchings discussed "Termites," M. B. Christian "Woodboring Insects" and Dr. A. F. Verrall "Wood Decay in Buildings." The annual Pest Control Operators' Banquet was held at 7:30 P. M. at the Istrouma Hotel with W. E. Anderson in charge. The toastmaster was Harry D. Wilson, Secretary of the State Department of Agriculture and Immigration of Louisiana.

On the third day, Wednesday, January 29, the morning session was given over to the common household pests: "Ants," E. R. Barber; "Fleas," A. Dugas; "Cockroaches," E. H. Floyd; "Bedbugs," L. S. Bridges and "Silverfish," I. J. Becnel.

During the afternoon Dr. J. H. Roberts demonstrated the mounting of insects in "wood-mounts" as approved by the National Pest Control Association. Many of the mounts were made by Pest Control Operators, and they were allowed to take away as many as they wished, free of charge.

At noon of the same day, the insects on exhibit for identification were correctly labelled with names in place of numbers, and all those interested could correct their mistakes, if any.

The Conference closed with a discussion of "Literature Relating to Pests and Pest Control" by Dr. O. W. Rosewall.

Those registered were:

Abel, H. O., Abel Exterminating Co., Dallas, Texas.
Ables, E. C., Orkin Exterminating Co., Baton Rouge, Louisiana.
Adair, H. S., Adair's Insect Control Service, Montgomery, Alabama.
Andersen, W. E., State Entomologist, La. Dept. of Agriculture, Baton Rouge, Louisiana.
Babcock, B. D., Northwest Exterminating Co., Inc., New Orleans, Louisiana.
Banister, Roy H., Cornett-Banister, Monroe, La.

Third Annual Southern Pest Control Operators' Conference

Louisiana State University, January 27, 28, 29, 1941, University, Louisiana

Banister, D. Ros, Cornett-Banister, Monroe, La.
Barber, Ernest R., Barber Laboratories, Inc., New Orleans, Louisiana.
Bedingfield, B. M., B. & R. Exterminating Co., Houston, Texas.
Becnel, I. J., Asst. Entomologist, La. Exp. Station, University, Louisiana.
Benschoter, J. G., Ben-E-Lene Co., Toledo, Ohio.
Bennett, H. J., Dept. of Zoology, L. S. U., Baton Rouge, Louisiana.
Beshis, Albert, Orkin Exterminating Co., Memphis, Tennessee.
Blair, C. R., C. R. Blair Laboratory, Alexandria, La.
Bridges, L. S., Pest Control Operator, Baton Rouge, Louisiana.
Broach, Joe, Orkin Exterminating Co., Birmingham, Alabama.
Burks, Leon, Southern Terminix Co., Baton Rouge, Louisiana.
Carraway, T. Ray, Northwest Exterminating Co., Inc., New Orleans, Louisiana.
Catchings, Thos. F., La. Dept. of Agriculture, New Orleans, Louisiana.
Chapman, Geo. H., American Cyanamid Corp., New York City.
Christian, M. B., A. B. Chapman & Co., Tallulah, Louisiana.
Craft, W. H., Graduate Assistant, University, La.
Crawford, W. H., Orkin Exterminating Co., Columbus, Georgia.
Callander, Pete, Pest Magazine, Kansas City, Mo.
Donnell, I. B., E. L. Bruce Co., Memphis, Tenn.
Dugas, A. L., Assistant Entomologist, La. Exp. Sta., University, Louisiana.
Echols, Geo., Orkin Exterminating Co., Birmingham, Alabama.
Eckert, Euberne, Horticulturist, La. State Capital, Baton Rouge, Louisiana.
Eddy, C. O., Entomologist, La. Exp. Station, University, Louisiana.
Floyd, E. H., Assistant Entomologist, La. Exp. Sta., University, Louisiana.
Frey, Fred C., Dean of Administration, L. S. U., University, Louisiana.
Gates, W. H., Dept. of Zoology, L. S. U., University, Louisiana.
Harp, C. W., F. A. York, Atlanta, Georgia.
Harry, Harold W., Graduate Asst., University, La.
Hill, Hubert, Monroe Exterminating Co., Monroe, Louisiana.
Hill, Col. Roy. A., Commandant of Cadets, L. S. U., University, Louisiana.
Hogan, John, Wizard Exterminating Co., New Orleans, Louisiana.
Howell, J. L., Howell Termite Control, Houston, Texas.
Huff, C. H., Ranger Termite Control, Galveston, Texas.
Hull, M. L., Division Agricultural Extension, University, Louisiana.
Iglinsky, William, N. Y. A. Assistant, University, Louisiana.
Jacobs, W., Mississippi Termiteal Co., Jackson, Miss.
Jackman, Donald L., Rose Exterminator Co., New Orleans, Louisiana.
Jackson, A. H., Miss. Termiteal Co,, Jackson, Miss.
Kaplan, Mark, Orkin Exterminating Co., Macon, Ga.
Kelly, Owen, Orkin Exterminating Co., Atlanta, Ga.
Kilmartin, John, John Kilmartin "Building Doctor," Laredo, Texas.
Kotler, Louis, Orkin Exterminating Co., Memphis, Tennessee.
Long, H. T., Long Exterminating Co., Houston, Texas.
Lowery, Geo. H., Dept. of Zoology, L. S. U., University, Louisiana.
Lyle, Clay, State Entomologist, State College, Miss.
Mandlebaum, Joseph, United Chemical Co., New Orleans, La.
Medlin, V. L., F. A. York, Atlanta, Ga.
Meek, Roy C., Entomologist, La. Dept. Agriculture and Immigration, Baton Rouge, Louisiana.
Millet, Eddie R., Graduate Assistant, University, La.
Mitchener, M. C., City Board of Health, Baton Rouge, Louisiana.
Mizell, Floyd, Assistant, La. Exp. Station, University, Louisiana.
Morris, Chas. G., Orkin Exterminating Co., Birmingham, Alabama.
Morris, W. E., Reliable Exterminating Co., Augusta, Georgia.
Morriss, R. M., Antimite Co. & Wood Treating Chemicals Co., St. Louis, Mo.
Nolen, R. H., Nolen Exterminators, Inc., Atlanta, Georgia.
Oser, Ted, Orkin Exterminating Co., Atlanta, Ga.
Parker, J. H., Parker Exterminating Co., Houston, Texas.
Pulford, Stafford, Assistant, La. Exp. Station, University, Louisiana.
Ragland, N. D., Monroe Exterminating Co., Monroe, Louisiana.
Raley, Thos. C., Getz Exterminators, Inc., St. Louis, Missouri.
Rees, E. T., B. & R. Exterminating Co., San Antonio, Texas.
Roberts, J. H., Associate Professor of Entomology, L. S. U., University, Louisiana.
Roberts, Wm. C., Instructor, Dept. of Zoology, L. S. U., Baton Rouge, Louisiana.
Rosenthal, Sydney J., Orkin Exterminating Co., New Orleans, Louisiana.
Rosewall, Prof. O. W., Professor of Entomology, L. S. U., University, Louisiana.
Roussel, John S., Assistant, La. Exp. Station, University, Louisiana.
Sartor, Grady, Getz Exterminators, Inc., New Orleans, Louisiana.
Sartor, Virgil, Getz Exterminators, Inc., New Orleans, Louisiana.
Schrouder, Harry, Monroe Exterminating Co., Monroe, Louisiana.
Seale, Wm. L., Jr., Orkin Exterminating Co., Savannah, Georgia.
Smith, Ed. J., Whitmire Research Corp., St. Louis, Missouri.
Smith, M. M., Douglas Public Service Corp., New Orleans, Louisiana.
Stamper, E. R., Pathologist, La. Dept. of Agriculture, Baton Rouge, Louisiana.
Treadway, Charles, Orkin Exterminating Co., Jackson, Mississippi.
Troyky, Julius, N. Y. A. Assistant, University, La.
Verrall, Arthur F., Pathologist, U.S.D.A., New Orleans, Louisiana.
West, Philip W., Assistant Professor of Chemistry, L. S. U., Baton Rouge, Louisiana.
Williams, C. L., U. S. Public Health Service, District No. 4, New Orleans, Louisiana.
Wirth, Willis W., Dept. of Biology, La. Polytechnic Institute, Ruston, Louisiana.
Wright, Fred P., Orkin Exterminating Co., Augusta, Georgia.
York, Fred A., Jr., F. A. York, Atlanta, Ga.
Zimmern, Alfred, Antimite Co., Dallas, Texas.

"Perpetual Motion"

By rigging up an electrocuting screen for flies, a Government fish hatchery has rid itself of these pests and by feeding the flies to the fish has cut down food bills.

—*Science News Letter.*

"Confirmation"

Since 1929 The Antimite Company has consistently recommended a definite procedure for the proper control of Termites. Recently the Bureau of Entomology of the United States Department of Agriculture has emphasized that certain fundamental principles and operations are vitally necessary in the control of subterranean Termites; namely,

1 - - Structural Modifications.
2 - - Soil Poison
and in many cases two additional operations are conceded as necessary; namely,
3 - - Drilling
3½ - Flooding.

It is gratifying to learn that the Bureau of Entomology now confirms the procedure that has proved so effective by the painstaking efforts of our reliable agents throughout the country.

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The Relation of Application to Efficiency

By A. M. AKERS, *Rose Exterminating Company, Cleveland, Ohio*

EDITOR'S NOTE: *One of the most practical talks given at the Purdue Conference was the one here reproduced in outline, presented by Mr. Akers. We urge every P.C.O. to read it carefully.*

1. **The Good Insecticide vs. the Good Operator.** The research workers and the insecticide manufacturers, who have developed and placed in our hands the various insecticides used in household pest control, have done much toward making our industry a success. We need this co-operation and the best insecticides for each particular job, and are probably getting the best that can be produced with our present knowledge. However, there is one element that is even more important than the best insecticides and that is a good operator—one who understands the problem and who knows why, when and how to apply the remedy to secure the best results.

I am very sincere when I say that we, in our office, would rather send out one particular service man on a bedbug problem with plain kerosene with which to do the job, than to send any other man with the best of insecticides. We know that thoroughness and correctness of application is the first consideration, regardless of the material used. Unless you are fortunate in having one or more such operators, it is difficult to understand that there can be a wide variation in the accomplishments of different service men.

Actual results must be accomplished by the good operator, but no small part of his success is found in his assurance when he starts the job that he is going to be successful, and thus passes along to the occupant the same feeling.

2. **Amount of Insecticide to Use.** It is as impossible to designate definite quantities of insecticides to be used as to tell a person the where and when of a treatment without seeing the problem. One must be guided by certain principles. There is a successful exterminating company in the South which also sells products direct to the consumer. They sell quantities of bedbug spray to householders, but the smallest package they offer for sale is one gallon. The owner states: "There is no such thing, in my way of thinking, as a pint of bedbug spray and it is an unfair practice to sell such a small quantity." I venture that most of us in this room would agree with this statement, even though we may not practice it.

The actual cost of insecticides is so small a part of a service sale, and the cost of repeating the service is so large, that I believe we should urge our service men to use plenty of the material at the time of the first service.

Tell the **good** operators to use **plenty** of chemical, and the results are practically assured. If the good operator is not crowded with too many other jobs for the day, he most likely will use the proper amount of spray. Usually too limited a time for the service, results in insufficient material for a proper and effective job.

3. **Dangers Offered in Non-Poisonous Insecticides.** (a) None of the oil bases commonly used can be applied to a mattress as they should be and then this mattress made available for use a few hours after, without some protecting covering between the mattress and the sheet. An operator may have his hands and arms soaked all day in a liquid spray and receive no ill effects, but let one lay all night in a sheet that is dampened by a mattress which still retains a moderate amount of the insecticide and the occupant may receive burns that are serious, as has been experienced in our city. A fair protection is secured by placing about six layers of newspapers over the mattress before putting on the under sheet.

(b) Fire is a serious hazard when any oil base is used. Sometimes perform the little demonstration we tried. Punch a half inch hole in a three-foot paper carton and place in an open space; afterwards inject the nozzle of an electric sprayer in the opening and run for a minute or so. Under the carton have a wick made of newspaper. Light the wick and step away. You will observe the explosion of a miniature bomb and henceforth both you and your service men will have a lot more respect for the oil vapor from an electric gun. After seeing such a demonstration I am sure you will be more careful about turning off the pilot lights on the kitchen stove and the light under the water heater, before making your spray application.

(c) Never start an electric sprayer in a room and leave the room. Under no circumstance should an electric sprayer be left running in a clothes closet with the door closed, for the brushes of the motor are certain to give off sparks which may explode the oil vapor.

(d) Guard against occupants slipping on a sprayed wooden floor. Anyone who has done service work with the use of oil sprays knows of the extreme slipperiness of oiled floors, but usually the occupant is not so informed.

(e) Avoid allowing operators to walk on sprayed carpets or rugs with rubber heels. Oil attacks rubber and oiled rubber heels are certain to make marks on any light colored carpet. We always have our service men put on 20 cent cotton bedroom slippers over their shoes.

4. **Thoroughness — The Essential Quality.** It is useless for me to say to this group that thoroughness is essential. The factor which stands in the way of most of us being more thorough is **Time.**

Listen to this:

Accept fewer jobs than you used to
But do them the best that you can.
Your surprise will be found at the year end
When the "profit-no-loss" sheet you scan.

The number of jobs isn't foremost,
Well done jobs will always bring more,
Your office will soon be expanding
While your competitor's closing his door.

5. **Demonstration of an Electric Sprayer.** I like to made the comparison of a good roach job in a drug store or a bedbug job in a house, with the work of an exacting dentist. Starting at one end, every crack and hole is examined and treated. Every surface and underside is examined. We all know how to do a good job, but our principle fault is that we do not take the time.

Did you ever try to find out what goes on in back of a baseboard or a door casing when you spray a liquid or powder into the cracks around them?

First, look at this useful tool we use to slightly enlarge these cracks without injury to the wood or plaster. This is an electrician's solid steel chisel, with a two and one-half blade. We wrap friction tape, **in a ridge,** around the handle just above the wide blade to act as a bearing surface, which will not mar the plaster or the woodwork. Inject the wide blade into the crack, bear down on the ridge of friction tape and you enlarge the crack. Usually, we tie a clean cloth around the friction tape, so that it, in itself, will not mark the wall.

I brought with me these rough samples of baseboards and door casings. Let us apply to the cracks around them, both a powder and a spray from a regular electric machine, and see what goes on behind the wall.

You will notice that it is almost impossible to hit the crack squarely, due to the operator's unevenness in holding the electric machine at a set angle while moving the gun up and down the crack in the door frame.

But if you will let the spray hit the **flat surface of the wall** in front of the crack, you see how much more of the spray gets out the back side of the crack into the wall itself.

In other words, more spray actually gets thru the crack if you let the mist "splash" thru, and the exact angle of holding the sprayer or duster is not so essential.

The only way to prove to your own satisfaction how to apply the spray from an electric gun, is to make a rough sample of a door frame like this and try it yourself, and let your servicemen try it. They most certainly will learn to improve their use of an electric sprayer.

The Common Pestiferous Rat Costs $2 a Year to Support

Have you a rat in your budget?

Rats cost about $2 a year apiece to feed and it is estimated that they destroy $2,500,000,000 worth of property annually—enough to buy 10,000 bombers, 1000 submarines, or more than 100 cruisers.

The rat has these major enemies in Memphis: the fire marshal, District Chief Joe Schaefer, and Dr. Rex Bushing, director of the Bureau of Sanitary Engineering in the City Health Department.

Rats Are Firebugs

Rats are firebugs, says Chief Schaefer. They build inflammable nests against chimneys, they gnaw insulation from wiring, they carry off matches to rubbish heaps.

Rats are brigands, stealing health, says Dr. Bushing. They transmit disease, especially endemic typhus, which is carried by the fleas that live on the rat.

A versatile, wary animal is the rat, a hunted outlaw and a veteran hitch-hiker. Like man, he has varied careers. House rats, barn rats, sewer rats, hotel rats, ship rats, exist. There is no Margaret Sangers in the rat world. Their families run as high as 40 a year, each one hoping to eat his $2 from your budget.

Rats find homes in enclosed spaces like boxed-in pipes, double walls, space under floors or stairways. Often they become squatters in piles of rubbish in basements and attics.

Traps a Good Method

Of all ways to make war on rats, traps are still the good domestic standby, authorities agree. Best weapon is the blockade, cutting the rat off from his food supply by ratproof containers and garbage cans. Cats and dogs, even if not aggressive, provide a "war of nerves" that hampers the rat.

Building out the rat is the most desirable, because it is the most permanent, method of control. The City Health Department does not exterminate rats, but officials are glad to advise citizens on methods.

(PEST CONTROL FIRMS ARE RECOMMENDED)

—The Commercial Appeal, Memphis, Tenn.

The world is a looking-glass and gives back to every man the reflection of his own face. Frown at it and it, in turn, will look sourly upon you. Laugh at it and it is a jolly, kind companion.—W. M. Thackeray.

What's behind the fumigant you use?

If it's Larvacide you have at your call expert service: literature dealing with special fields of work, also personal help with your special problems. • This service is based on the results of sixteen years experience in every field of fumigation work. • Larvacide pioneered the use of chlorpicrin in pest control and has introduced every major improvement in its use. • Write for Profit-pointing literature, prepared especially for the professional fumigator.

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What Composition for Roach Powders

WHAT is the best all-around composition for a roach powder —and why? Off hand, this question might appear easy to answer, particularly if the reply is sought among pest control operators who have had some years of practical experience in handling bad roach infestations. But the answer is not as simple as giving the best composition and letting it go at that. If the answer may be judged by the diversity of opinion among insecticide manufacturers and pest control operators, there simply is no one ideal formula for a roach powder.

No matter what the suggested composition, there are criticisms of one kind or another which appear valid. Pyrethrum deteriorates, sodium fluoride is poisonous, borax is too slow and uncertain, rotenone is involved by patents,—and the arguments against combinations of these materials are merely combinations of the arguments. There is the matter also of phosphorus paste which is widely used by professional operators in roach control, but this product is purposely not being included in the discussion here as it does not enter into a controversy on powders.

In order to secure a cross-section of opinion on roach powder composition from insecticide manufacturers and pest control operators, one hundred firms were selected mostly at random from among the subscribers to Soap & Sanitary Chemicals in these fields, and a questionnaire asking various questions on roach powder was sent to each. To the large number who returned these questionnaires so that this report might be compiled, the editor is extremely grateful. Their answers reveal a wide variation in opinion, far wider than was anticipated when the questionnaire was sent out. Little attention has been paid to the technical literature apparently or to any organized research, most reporting firms basing their answers on observations in actual use or on the particular combination which they are now manufacturing and selling. A compilation of the data given in the answers must be set down solely as a cross-section of opinion in the trade.

Because the materials used as killing agents in roach powders today have narrowed down to pyrethrum, sodium fluoride, and borax, these are the products chiefly considered. The use of combinations of derris, cube, and other rotenone-bearing materials is naturally limited owing to patent complications. The use of pyrethrum with derris and other rotenone powders in combination is covered by patent and cannot be used except under license. Of the total roach powders made and consumed, probably ninety per cent are composed of pyrethrum or sodium fluoride, or mixtures of these. Borax finds only limited use today even though it is classified as an active ingredient by the Department of Agriculture.

If the most effective all-around roach killer is to be named. Sodium fluoride is that product. Of course, this is not news to those in the trade. At the same time, the opinion is not unanimous in this respect. There are those who state that pyrethrum is just as effective, that is, if it is a high-grade powder running 0.7 per cent in pyrethrum or higher. And thereby hangs the tale. Advocates of straight pyrethrum as a roach killer point out that many pest control operators and some manufacturers have had practically all of their experience with low-grade pyrethrum, that is, powders which were originally only 0.4 or 0.5 per cent pyrethrins, or lower, or powders which are old and have deteriorated badly. They buy cheap, off-grade powders, it is stated, and then base their observations of effectiveness of pyrethrum on these powders, whereas they do not represent the actual effectiveness of a freshly milled, high-grade powder against roaches.

Irrespective of the merits of these arguments, the fact remains that pyrethrum does deteriorate and sodium fluoride does not, and where both have been kept in storage for long periods, the fluoride loses none of its effectiveness and the pyrethrum does. This is the main point, not considering cost, according to those in the trade, which influences exterminators and manufacturers to give sodium fluoride preference. But cost is also considered and always will be, and it is here that sodium fluoride which sells usually at half of pyrethrum prices, and often at only one-third, also has a great advantage.

Were sodium fluoride non-poisonous to humans, it would undoubtedly be the ideal roach powder. But the fact remains that it is poisonous, not deadly poisonous in the sense of cyanides or thallium salts, but sufficiently so that it is classified by even the most liberal health officers as "highly toxic." This should and does limit the places where it is used if safety is to be considered, and where this safety factor is ignored, the results are sometimes disastrous as every pest control operator knows. And it is a guess that many instances of "food poisoning" have been in fact mild cases of fluoride poisoning traceable to the wrong or careless use of this very effective insecticide material in kitchens of restaurants and hotels. It is for this reason that its use in some cities is forbidden by statute in and around places where food is stored, prepared or served.

Outside of the danger in its careless use,—and the fact that some exterminators maintain that it is too hard on their operators, — sodium fluoride has one other weak point in roach powders. It does not knock the roach down quickly enough. It gives him a chance to run away and hide and die out of sight, and this is not held to be good psychology for a bug killer. The housewife,—where a packaged insecticide is used,—wants to see the roaches stopped dead in their tracks. Where they run into the cracks and die later, she is not convinced that they are dead, particularly if she sees other roaches on subsequent days. And, of course, this is why so many manufacturers add a percentage of pyrethrum powder to their sodium fluoride, anything from 10 to 70 per cent,—to knock the roaches down.

The opinion appears to be almost universal among professional pest control operators that in mixtures of this kind, the pyrethrum knocks the roach over and the fluoride kills him. Obviously, if it were not for the psychological effect, the addition of pyrethrum to sodium fluoride roach powders would be superfluous. As it is, many manufacturers and operators ignore this point and do not use pyrethrum in their mixtures, maintaining that sooner or later the use of the straight fluoride powder will clean up

the infestation and that this will be the best demonstration of the effectiveness of the product. Once again the point is made that if the pyrethrum is of low-grade, not much can be expected from it even as a knockdown ingredient, and if it is a high-grade pyrethrum, the facts are quite definitely established that it will kill roaches of all kinds irrespective of prejudices to the contrary among some professional pest control operators.

When it comes to non-poisonous roach powders, the manufacturer and exterminator are quite definitely limited. For an insecticide requiring positive and quick action, nothing appears to be left except straight pyrethrum. For the household package, this is answered by the customary can of insect powder, although the bugaboo of deterioration which has always bothered the packagers now rises to full height and takes on added significance on account of the new labeling regulations issued by the Department of Agriculture which became effective last September 1.

For the professional exterminator, it is not so much pyrethrum deterioration, but cost. On contract jobs, pyrethrum is an expensive material, particularly when the prices of the past two years are considered. Fluoride is so much cheaper that it is a temptation to use it even where it is banned. Some exterminators, finding pyrethrum costs too high, are using special pyrethrum activated dusts, sometimes mixed with pyrethrum, sometimes as is. A few cut pyrethrum with powdered borax principally to reduce the cost. This addition of borax runs up to 50 per cent, although some exterminators maintain that anything over 20 per cent of borax reduces the effectiveness and speed of action too greatly.

Some professional operators are reported using derris, cube, and other rotenone powders mixed with three or four times their weight of talc, chalk, clay or other inert powder for roach control where a non-poisonous insecticide is called for in foodstuffs, plants, candy factories, bakeries, restaurants, etc. The results are stated to be very encouraging. The dilution of the derris is usually made to bring it down to one per cent rotenone or less, at which figure it is reported effective against roaches. Although this is not believed to be widespread practice at the present time, reports indicate that some exterminators are trying out the method. At the present prices of derris, cube, etc., these materials used thus are placed on a competitive basis with sodium fluoride. The drawbacks as pointed out are that the effectiveness of derris due to deterioration is only slightly longer than that of pyrethrum, and the rate of action on the roaches is slow compared with pyrethrum. Where derris or cube are used merely with a diluent such as talc, clay, etc., there are no patent difficulties. Only when used in combination with pyrethrum are the rotenone materials covered by patent, and even in this case, royalty fees are low and inconsequential in the cost of the material.

So far, little has been mentioned about borax as an ingredient of roach powders. The fact that its use as such has dwindled to comparatively small proportions during recent years appears to give the answer as far as the trade is concerned. Borax is cheap and safe to use. These are its good points. But the extreme slowness of its action on insects practically classifies it as a diluent where it is used. Published evidence indicates that borax requires from four to seven days to kill a roach and is not always certain even in that length of time. In practical use its main function is to reduce costs and dilute other ingredients. Majority of expressed opinion in

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This insecticide is milled into a clean, fine powder that passes easily through the usual powder blowers and dusters.

It is practically odorless, non-inflammable and eminently suitable for use in dwellings, hotels, restaurants, schools, institutions, ships, etc.

To control and exterminate household pests when they are once established on the premises requires persistent efforts over a period of time.

The modest price at which this insecticide is sold will enable the purchaser to use it freely and obtain prompt results.

PRICES

10 lbs. @ 25c per lb.
25 lbs. @ 22c " "
100 lbs. @ 20c " "
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151 West 19th St. New York, N. Y.

the trade appears to indicate that borax has no place in a roach powder except as a filler.

Borax has been classified as an active ingredient in roach powders for some years by the Department of Agriculture, and still is, according to recent confirmation. It may be designated as such on the label. The question was recently raised in the trade, however, whether borax is considered 100 per cent an active material or whether in view of stricter regulations on pyrethrum labeling, the same might not also apply to borax in the matter of water of crystallization which it contains. This water of crystallization approximates 47 per cent of the total weight of the borax which has a chemical formula, $Na_2B_4O_7$. 10 H_2O. However, inasmuch as the water is part of the definite chemical compound, the entire compound including the water of crystallization is considered active. If a liquid (water) product containing borax were marketed as an insecticide, then only the 53 per cent anhydrous part of the borax could be counted as active.

It is pointed out that in a statement of active ingredients on a roach powder, the impurities in sodium fluoride, for example, which are sodium sulfate, sodium chloride, and sodium carbonate, are not chemically combined with the fluoride are separate products altogether and are considered inactive. On the same basis, if borax used in a powdered insecticide contains any impurities such as sodium carbonate, etc., these must also be calculated as inactive ingredients as in the case of sodium fluoride. Only the water of crystallization is excepted.

The matter of including baits of one sort or another in roach powders has also been given thought by both manufacturers and operators. The idea of including some food material in a fluoride roach powder as an inducement to the roach to "eat" the material and thus get the poison into his stomach, has long been behind the use of baits. Both manufacturers and exterminators lean to this idea, and some of them include varying percentages of cocoa, flour, starch, or some other food material. Mixtures of sodium fluoride with equal parts of starch or flour are sometimes used, particularly by professional operators. The majority of roach powders, however, do not contain baits. As far as can be determined, the advocates of the idea are in the minority.

Some operators maintain that a roach poison will do a better and faster job when it contains a bait. On the other hand, baits are held to be useless and are classified as fillers. It is the contention of some manufacturer that a roach rarely deliberately "eats" a roach powder and that any formulation based on such an idea is faulty. When a roach walks through fluoride or any other powder and gets it on his legs and feelers, he will always clean off any powder adhering to these appendages by drawing them through his mouth, and in this way the fluoride gets to the stomach. The roach will do this whether the powder contains a bait or not. Furthermore, where a fine powder is properly applied, the roach will be forced to walk through it to get out to his supply of food and he cannot avoid getting it on his legs, it is held.

As has been pointed out on several occasions, the problems of the insecticide manufacturer and of the professional exterminator as far as roach powder composition are concerned, are widely different. The pest control operator chooses his powder for his own use or the use of his men. He applies it and sees the results of its application. He is an expert in application based on his knowledge of the habits of the insect which he seeks to exterminate. If it is possible to obtain effective results with any given powder composition, the exterminator should be and usually is the one to get these results.

Labor represents the most expensive part of a professional exterminating job, and as a consequence, operators cannot afford to fool around with materials of questionable effectiveness. Their operations must get results. And it is probably for this reason chiefly that the majority of exterminators, considering all phases of roach control, lean so heavily in the direction of sodium fluoride and upon not infrequent occasions use it in places where they know its application may be dangerous.

The problem of the manufacturer of packaged roach powder for retail sale is a different one. Even if he puts out the finest product in the world, it may prove to be ineffective because of misuse. The American public is notorious for its refusal to read label directions and roach powder is no exception. At the same time, if a consumer buys a can of roach powder and uses it as his imagination best dictates, and the roaches continue to frolic nightly in and about the kitchen, he merely makes a mental note that the product is no good, and tries some other brand. There is the loss of a customer for the original manufacturer, but no loss of his time or materials as in the case of a pest control operator. The manufacturer is not in direct contact with the customer as is the exterminator, and the demand for results is less imperative. The manufacturer, however, has the problem of packaging and especially labeling to contend with, the latter becoming increasingly serious as time goes on.

(To Be Concluded)

—Reprinted from October, 1940, issue of Soap.

British Government Launches Publicity Campaign to Combat Rat Plague Brought On by Raids

According to William Dalton, member of a family that has been studying the catching of London rats since 1710, flames reducing scores of buildings to smoldering embers during a recent fire bomb attack on the oldest districts of London—the square mile that includes St. Paul's—still left some 250,000 rats alive. Presumably countless hordes of them fled the scene of ruin to find new homes.

The Government in launching its publicity campaign to householders, business men, landowners and farmers to do their best to curb the rat menace to national safety estimated an annual damage of 25,000,000 pounds.

In the urban communities the creatures take advantage of battered houses easily entered. Black or ship's rats have been found infesting steel and concrete buildings believed impregnable. They have filtered in by roofs, gutters, rain pipes, doors and windows or where the shocks of a nearby explosion have opened a hole or crevice.

Nightfall sends them out searching for water. Usually they will discover quarters more to their liking than those they have just vacated, and the invasion continues.

Responsibility for rat control is handed on to local authorities and ultimately to the individuals occupying infested premises. Failure leads to fines.

Leaflets prepared for wide distribution display a sneaky rodent curling down beside red lettering "Kill That Rat" and at the bottom "It's Doing Hitler's Work."

Housewives are advised they can help in three ways: 1. Kill any stray rats around the home. 2. See that food is beyond their reach. 3. Make the house rat-proof. Owners of factories, shops, granaries and warehouses are also urged to take drastic measures for rat curbs.

Furthermore, the point is driven home that rat killing is not something that can be put off, because if one citizen obediently clears up rats while his neighbor fails, both suffer.

Farmers and landowners get about the same information as city folk on the best ways to handle this problem, with the further advice to trap and also "gas them in hedges." Ferrets are suggested.

The ministry of Information has also produced a motion picture featuring rats and the damage they cause.

—Digested from article appearing in N. Y. Times.

A dose of poison can do its work but once, but a bad book can go on poisoning minds for generations.—John Murray.

Still Another Way – This Time It Is Electrocution

By ERNEST M. MILLS, *Fish and Wildlife Service, U. S. Department of the Interior*

CONTROLLING rats nowadays is something like the treatment being meted out to convicted murderers. Some states use gas chambers for the execution of criminals, some operators use gas for extermination of rats. Some states electrocute their criminals and now, not to be outdone, we find that rats are being electrocuted.

This should prove the old adage that there is something new under the sun. It is an electric rat trap. Obviously, the public in general and the pest control operators in particular are interested in new and what might be termed novel methods of rodent control, hence the subject of electrocuting rats merits attention. Numerous inventors have throughout the years tried their skill to develop some method to destroy rats by electricity.

In his book, "Rats and How to Destroy Them," Mr. Mark Hovel states, "In the Paris sewers rats have been electrocuted by a live wire about four inches above the level on which the rats travel with bait hanging at intervals close above the live wire. A rat, on attempting to reach the bait, touches the live wire and is killed."

A number of U. S. Patents have been issued for electric rat traps, a few of these are numbers 1,541,985; 1,899,199; 2,098,884; 2,191,127; and 2,191,229. (Copies of patents may be obtained by remitting ten cents each to the U. S. Patent Office, Washington, D. C., or they may be consulted at the larger public libraries.)

At the last annual inventors' congress at Los Angeles, Mr. Frank Ford exhibited an electric mouse trap. It is described as follows: "Not much sooner has a mouse, enticed within by the inevitable hunk of cheese, been caught and killed by an 8,000-volt current, than his lifeless form drops through a trapdoor and the mechanism is ready for its next victim."

In considering electric traps, one should understand the nature of the electric shock. The primary cause of death from the application of electricity is due to heart failure, resulting from ventricular fibrillation. Some animals, including rats, recover spontaneously from ventricular fibrillation, once the current is interrupted. Other animals do not recover spontaneously and man is in the latter group. Thus, rats are more resistant to electric shock than man, dogs, horses, and certain other animals.

A review of the literature does not reveal the exact details as to the current required to kill all rats under all conditions. The Underwriters' Laboratories gives the following factors determining the seriousness of electrical shock: (1) body electrical resistance; (2) voltage and frequency of the circuit; (3) amount and nature of current passing through the body; (4) part of the body through which the current passes; (5) length of time current flows through the body, and (6) element of anticipation. One test on 26 rats with 550 volt alternating current with 240 to 490 milliamperes for one to four seconds resulted in the death of 3 rats, paralyzation of 13, and the recovery of 10. It is very evident that more experimental work is necessary to find the right combination to give satisfactory results for electrocution of rats.

There are several objections to electric rat traps. These traps may be dangerous to human beings unless carefully constructed and used by persons experienced in handling electrical apparatus. Some of the patented traps utilize 110 volt current while others employ a transformer to step-up the voltage. There have been a few human fatalities with 110 volt current and one fatality has occurred from contact with a circuit of 45 volts at 50 cycles. One authority is of the opinion that an individual can not be safely subjected to a continuous (uninterrupted) current in excess of five milliamperes. Thus, the hazardous nature of electric traps should be seriously considered.

The next objection to electric traps is the question of successive electrocutions. An experimenter of the Animal Trap Company related that a rat would emit a loud squeal when receiving an electric shock so that other rats would be frightened away. Also he found that provision must be made for removing from sight an electrocuted rat in order for other rats to approach the trap. This investigator was unable to overcome the "squeal" objection.

It is rather doubtful that electric rat traps can be manufactured commercially so that the public can obtain them at low cost. Under most conditions, it is necessary to use a large number of traps of any design to obtain satisfactory results. From a practical viewpoint, such traps must be cheap, readily available, easily operated, and of simple construction for the average user or pest control operator.

However, it is in the realm of possibility that a simple, safe, and foolproof electric rat trap might be developed. Already electric screens are being used rather extensively along with light traps for the control of insects. What now seems a bit fantastic as far as the control of rats is concerned, may tomorrow be commonplace.

Australian Ant is Friend of Farmer

Berated as pests though ants universally are, one species at least, the Greenhead ant of Australia has been proved to be decidedly the farmer's friend. Prof. H. B. Fell of the University of Edinburgh has reported on studies he made of a number of colonies of this ant during a recent visit in the southern continent.

The Greenhead ant, unlike many other kinds of ants, is not a scavenger, but a hunter preferring to catch his meat "on the hoof." The food of a colony, comprising a few hundred individuals under observation for 11 hours, on a percentage basis, ran as high as 77.5% of beetle, moth and fly larvae. One colony Prof. Fell estimates will destroy more than 45,000 harmful grubs in the course of a year. —*Science News Letter.*

Manufacturers Exterminating Supplies

Write Today for Complete Catalog

Thos. W. Houchin Corp.

87 Ferry Street
Jersey City, N. J.

Estab. 1851

Sell More Pest Control Jobs

USE COLORED – REALISTIC – FULL SIZE INSECT DISPLAYS - 9 TO 15 INCHES

Artistic in appearance. . . Professional in atmosphere. . . Displayed at N. Y. and Indianapolis N.P.C.A. Conventions. . . Low in price. . . Right in attention value.

Write for price list and circular matter.

MICHAEL F. ABT, Route 3, Box 964, Memphis, Tenn.

When Writing to Advertisers Mention "Pests"

Fourth Annual Pacific Coast Pest Control Operators' Conference at University of California, Berkeley, California, Feb. 20, 21, 22, 1941

Attendance Tops All Their Previous Records—161 Registrants Representing 89 Separate Firms Sign In

1-2-3-3½ Fundamentals of Termite Control Endorsed as Suitable Working Basis—Resolution Addressed to Dr. Lee Strong, Chief of Bureau of Entomology and Plant Quarantine Urging Continued Interest and Cooperation in Household Pest Control Research, Passed Unanimously

PACED by a galaxy of fine speakers at the Fourth Annual Pacific Coast Pest Control Operators' Conference, the P.C.O.'s of the West Coast responded with a record breaking attendance which was matched by a comparable warmth of interest in the proceedings themselves.

Giving bountifully of their time and abilities, condign praise is due Conference Director Prof. Wm. B. Herms, chairman of the conference; Mr. George A. Rader, the associate director; Dr. F. G. McLeod, and their able staff of assistants who were instrumental in making possible such a successful program.

1-2-3-3½ Fundamentals of Termite Control Endorsed

During the conference the termite principles embodied in the N.P.C.A.'s Communication No. 166 were presented for possible endorsement of the 86 persons present, the group endorsing the principles as suitable for a working basis for further consideration.

Resolution Urging Research Passed

A resolution formulated by Dad Alderman and George Rader, and addressed to Dr. Lee Strong, was unanimously adopted by the gathering. It follows:

WHEREAS, the problem of household pest control can be solved only as fast as scientific research shows the way, and

WHEREAS, the scientist and the professional pest control operator know that methods of control now in use are many years behind the times, and

WHEREAS, we believe that the members of our industry and the Bureau of Entomology and Plant Quarantine both feel the vital necessity for more adequate funds to conduct further research,

NOW THEREFORE be it Resolved, that we, the members of the Pest Control Industry assembled in conference at the University of California, do urgently request your continued interest and cooperation in household pest control research.

Conference Talks and Papers

Subsequent issues of PESTS will carry reprints of most of the conference talks and papers. The complete Conference outline appeared in our February, 1941, issue.

Conference Banquet

Dr. Stanley B. Freeborn, Assistant Dean of the College of Agriculture, University of California, toastmas-

"Owing to the liquid sunshine to which Sunny Californians are not accustomed, many of the 161 registrants were not on hand when the picture was taken."

tered. There were 138 present at the banquet which carried the theme of "A NIGHT IN PARIS." The star performer was Marta De Meter who was the star of the 'Follies Bergere." Dancing till midnight brought to a close the gala festivities.

California Pest Control Association, Inc., Holds Annual Meeting

Interesting reports rendered by President Miller, and by the various committee chairmen on the past year's accomplishments; legislation discussed at length as well as other matters of vital importance. Prevue of the film "PESTS" being developed by the members of the association, was a feature.

Mr. E. G. Mills, of San Francisco, was elected president, and Mr. Wm. Hogan, of Pasadena, vice-president, for the ensuing year. With association direction in such capable hands and with continued cooperation from the association membership there should be much of constructive value accomplished for the industry.

A most enjoyable address was given at the noon luncheon by Dr. J. C. Geiger, Director of the San Francisco Health Department. He voiced the opinion that the pest control operator was definitely an asset in public health problems.

The day's activities were completed when all adjourned to attend the banquet at 6:30 P.M.

Legislation

Mr. L. R. Alderman made a special trip to Sacramento to the end that proper legislation may be passed for the protection of our industry.

Messrs. J. M. Miller and Wm. Hogan, who attended the meeting of the State Chamber of Commerce at Fresno recently, reported they were successful in convincing that body that bills No. 810-826 and 1057 were unfavorable legislation. As a result of their efforts the vote for opposal of these bills was unanimous.

Women's Auxiliary

While the men were attending to their conference "knitting," the ladies got together and adopted a constitution covering the state wide activities in their association. The organization will be known as the Women's Auxiliary of the California Pest Control Association, Inc. Newly elected officers are: President, Mrs. A. T. Parsons; Vice-President, Mrs. J. E. McNatt; Secretary, Mrs. E. G. Mills; and Treasurer, Mrs. Wilbur F. Smith. Dues to the organization will be $1.50 per year, payable to the local treasurer.

"Pest Control"

Another outstanding resolution which was adopted at the state convention was for the request for unification in connection with classified telephone directories as this would have to do with proper headings. The association unanimously adopted a similar resolution to that which was adopted by the National Pest Control Association at the Memphis convention in 1937, seeking for one major heading; namely, **pest control** and all other headings to appear as cross reference listings.

Ornithodoros Viguerasi, a New Species of Tick from Bats in Cuba (*Acarina: Ixodoidea*)

Larval, nymphal, and adult specimens of a very interesting new bat tick have been received from Cuba. It is named *Ornithodoros viguerasi* in honor of the collector, Dr. I. Perez Vigueras, University of Habana, Habana, Cuba.

Excerpt from an article by R. A. Cooley, Entomologist, and Glen M. Kohls, Assistant Entomologist, United States Public Health Service, appearing in Feb. 28, 1941, issue of Public Health Reports.

SOLVAY
TRADE MARK REG. U. S. PAT. OFF.

PARA-DICHLOROBENZENE
. . . *for MOTHS*

ORTHO-DICHLOROBENZENE
. . . *for TERMITES*

● **Available for quick spot shipments from over 100 stock points!**

In the rush season, delays hamper operations and cost you money! Solvay distribution service on Para-dichlorobenzene and Ortho-dichlorobenzene is available from over 100 stock points and branch offices . . . making sure that your orders are promptly filled and sent to you *without delay*. Write or telephone to the nearest branch office listed below or to

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 Rector Street New York

Branch Sales Offices:
BOSTON CHARLOTTE CHICAGO CINCINNATI
CLEVELAND DETROIT NEW ORLEANS NEW YORK
PHILADELPHIA PITTSBURGH ST. LOUIS SYRACUSE

Here's THE SAFETY YOU NEED AND COMFORT YOU'LL ENJOY!

THE M·S·A "GMK"
HYDROCYANIC ACID
GAS MASK
with the
ALL-VISION FACEPIECE

IN HANDLING HCN
The pest control operator wears this comfortable mask in complete safety and unhampered working freedom—enjoying unobstructed vision through large-area lenses, absence of lens-fog, reduced dead-air space in easy-fitting, molded rubber facepiece, and many additional refinements. U.S. Bureau of Mines-approved.

FOR CHLORPICRIN PROTECTION
With "GMC" Canister, the Mask provides lightweight, well-balanced protection against concentrations of chlorpicrin gas as used in exterminating. Write for detailed Bulletin No. ED-7.

MINE SAFETY APPLIANCES COMPANY
Braddock, Thomas and Meade Streets, Pittsburgh, Pa.
District Representatives in Principal Cities

Ethics In Business

By T. M. OVERLEY, *Indianapolis Better Business Bureau.*

EDITOR'S NOTE: *The following address was given by Mr. Overley at the National Pest Control Assocation Convention, Indianapolis, Ind., October 28, 1940.*

THE subject of ethics in business is a vast one. Briefly defined, it is the science of morality or of proper conduct. It involves the problems of business relationships and activities all the way from the simple courtesies between competitors and between business and the public, all through the gamut of terminology, descriptions, and standards of practice, to the question of deception and outright legal business fraud.

I believe that the principles of selling as applied to your business, are sufficiently similar to the fundamental principles of selling groceries, yard goods, hardware and machinery, as to be applicable interchangeably. All forms of selling and all lines of business have much in common in that they are forced to deal with the buying, consuming public, and human nature in the aggregate is prone to follow rather definite lines.

With your indulgence therefore, I would like to give you certain observations and conclusions of my own, from which I trust you may be able to make some application to your own benefit, or at least which may be of some passing interest to you.

I do not believe any man in his right mind would deliberately and studiously engage in practices which he felt would keep customers from his business, or that would destroy his opportunity to get the greatest possible return on his investment. The causes for dishonest and unfair business practices are so complex and multitudinous as to preclude an individual cataloging of all of them. They involve training, experience, education, financial condition, equipment, locality, nature of competitors, and on and on through a gamut of opposing business theories, even to racial tendencies. Their discernment and eradication involves a complex and highly difficult procedure.

We have business men, whom I am glad to say are in the minority, who have no scruples whatever, in their representations, or in the conduct of their business; their sole thought being the closing of the deal within such legal limits as will enable them to avoid arrest or prosecution.

At the other extreme, we have plenty of business men so high-minded, so fearful they will offend a purchaser, that they will submit to extreme limits of imposition rather than to contradict or to them take the chance of offending a consumer. Between these two extremes we have every conceivable type. We must remember also that all business men are human beings, and it is my understanding that the human being has not yet been found who does not make mistakes. And let him who would draw conclusions of criticism from unintentional mistakes consider first his own weaknesses or the mote of his own eye in this respect.

I am going to criticize some business practices and some public characteristics pretty severely. Before I do so, however, will you please let me make it very definite and very clear that the criticism is leveled at minority groups. I have had tens of thousands of contacts with hundreds upon hundreds of business men and consumers. I have come in contact with trickery and deceit on the part of individuals from both groups in a multitude of forms. I am still thoroughly convinced that the average business man and the average consumer is honest in his intentions and purposes; that the overwhelming majority of business men and consumers endeavor to do what they consider to be the honest and the right thing. The best of them on occasion err in their judgment, go haywire in their thinking, and are mistaken in their actions; and in nearly every one of these instances such mistakes are mistakes of judgment rather than of intentional dishonesty.

Honesty in business is commonplace, and does not attract attention. It is not dramatic; it does not make news. It does not provide a cause on which movements can be based. It is the unusual which attracts attention, which makes the headlines, which makes good publicity. This may explain why some of the so-called guinea pig books have proved so dramatic and attracted so much attention.

Although dishonesty in business is confined to a relatively small proportion of its members, it can still be objectionable; it can still be dangerous, if not curbed or removed. Small transgressions through retaliatory tactics can grow into big competitive and consumer problems that are disastrous, just the same as small fires if not squelched in their beginning by an efficient fire department, can grow into large conflagrations that cause serious economic loss and public damage.

Unfair practices on the part of minorities are just as unsatisfactory and have within them the elements of damage the same as the rotten apple in the barrel, which if not removed, will tend to contaminate those about it in an ever widening circle.

Please remember again, therefore, that the criticism which follows, while it involves large numbers of business concerns, nevertheless, does not represent the fundamental activities of all business. I am also confining my criticism mostly to advertising practices, because that is the field in which I am best acquainted and with which I have had a large experience.

All manner of tricks and devices have been used by the enterprising copywriter to attract the public. For some obscure psychological reason it has seemed to some advertisers less venal, or less objectionable to misrepresent in print than it is to misrepresent by personal word. Business men have written and approved advertising schedules with bombastic and exaggerated, if not false or deceptive statements, when they could not have made such a statement personally without having turned red with embarrassment. They have by phraseology, arrangement and illustration conveyed inferences and innuendos regarding competitive merchandise or competition, or made statements or implications about their own products, which they would not have dared to say face to face to another business man who knew what they were talking about.

A casual examination of the advertising in some of our publications, even the best of them, will often provide an amusing diversion. Their humor has been capitalized with the sarcasm of Ballyhoo and similar publications. Listen to these, all of them appearing in sufficiently recent advertisements to undoubtedly be remembered by most of you.

"Five automobile companies, each claiming, 'Best-in-the-world' values. Three shaving-cream companies, each claiming, 'smoothest and coolest shave'. Three cigarette companies, each claiming the use of 'finest and costliest tobacco.' Three antiseptic mouthwash companies, each claiming, 'one-half to one-third the cost' of other mouthwashes, followed by another claiming that, 'it attacks the cause of bad breath.' Three toothpaste companies each making incredible claims, one of them promising to make teeth 'three shades whiter in three days.' Three gasoline companies each shouting 'supremacy,' followed by one claiming, 'not one, not two, not three, not five, but ten premium qualities keep . . . gasoline a year ahead of competition.' Two chewing gum companies, one claiming power 'to beautify the face' and the other announcing, 'The dawn of a new health habit—as old as man—as fundamental as digestion—as important as the regulation of the bowels—Chew . . . chewing gum.' Two soap companies, one claiming the power 'to make your skin and you lovely' and the other stating, 'If you want success in love and business bathe regularly with . . . soap.' "

Numerous correspondence schools would have you believe that after your first payment on their course, you are assured of a better job, and if you are unemployed you are over the hill on your way to fame and fortune, if you'll put your name on the dotted line.

In addition to the above cited statements, which in principle are quite common today, we find our advertising full of pictured absurdities and illustrations that pile up the discount and help to reduce its believability. We find incredible home painting jobs are done by unruffled ladies without soiling their daintily manicured fingers or without getting one spot on their spotless bungalow apron. Serious business conferences are being interrupted by a hot tip on shaving cream.

The dreaded secret of broken homes and fractured marriage vows are exposed . . . and so is given the only known remedy . . . a bottle of halitosis water. Fat reducers show how to make a human molehill out of a mountain in three days or three weeks, with one box of cathartic crystals, eating a specially baked bread, or by drinking certain kinds of beer, grape juice, or even malted milk. Flesh rebuilders will round out the curves and cover the bony places so that they will attract and not scare away the desired members of the opposite sex.

Someone has said there is no telling how long old Methuselah might have lived if he could have had his teeth, tonsils, adenoids and appendix out; used the right brands of mouthwash and toothpaste, and smoked coughless cigarettes.

Glowing testimonials of all kinds from celebrities who possibly would never have thought of using the product which they endorsed if they were not paid to do so. So-called laboratory tests offer scientific proofs or everything under heaven—nearly always omitting however the one thing of importance in such tests, to the thinking or the knowing individual—and that is, *who* made them, and what do they know about such things anyway.

I believe we can subscribe without fear of successful contradiction to the conclusion that advertising as a whole is subject to discount. It would be hard to imagine any more damaging admission than this, for we are immediately confronted with the trouble into which promiscuous discount always gets us, viz., how much discount? How fast will the discount increase in the face of competitive

LEADING FUMIGATORS

ARE ADOPTING

ACME *FULL VISION*

Acme Full Vision Gas Masks, equipped with Acme Type HCN Canisters, are rapidly being adopted by scores of the largest fumigators and gas mask users in the country.

FULL VISION, an exclusive Acme feature, affords the wearer unobstructed vision, and provides greater safety and efficiency.

Write for Folder M387 on Acme Canister Masks.

Acme Protection Equipment Co., Inc.

Manufacturers of Respiratory Protective Devices

3605 Liberty Ave. Pittsburgh, Pa.

A PREPARED RAT BAIT

19½c PER POUND IN ONE POUND TIN CANS

NO FUSS - NO MUSS - NO MIXING

USE

HAN-DEE* RAT KILLER

HAN-DEE Rat Killer is a scientifically prepared rat bait, which is mixed ready for use, you simply open the can and place the baits with a spoon. The toxicant is oven dried red squill, which has been biologically tested.

HAN-DEE is packed in MEAT, FISH and CANTALOUPE baits to afford you a variety of baits, for your convenience HAN-DEE is packed in one pound sealed tin cans—no stale bait to be used next day with HAN-DEE, always ready for use when you need bait.

HAN-DEE may be used with safety in restaurants and packing houses where poisonous materials are prohibited.

Packed in cases of three dozen, one pound cans, either in one kind of bait, or any assortment of the three baits.

Write For Descriptive Literature

	Per Doz.
THREE DOZEN (1 CASE) LABELED	$2.50
GROSS LOTS, LABELED	2.40
GROSS LOTS, NO LABELS	2.35

Freight prepaid on gross lots to all points east of Rocky Mountains.

*Formerly SUR-RID

SUR-RID PRODUCTS COMPANY

455 PAUL BROWN BUILDING, ST. LOUIS, MISSOURI

exaggeration? As one writer has put it, "if advertising is to be progressively discounted, how far can it stop short of 100% discount? And when we get somewhere between 100% belief and 100% discount, where are we?

Is it any wonder that a jocular sonnetteer has given his conception of the modern advertising man as one who is,

"Glorifying pink chemises, eulogizing smelly cheeses,

Deifying rubber tires, sanctifying plumbers' pliers,

Accolading rubber panties, serenading flappers' scanties,

Rhapsodizing hotel fixtures, sermonizing on throat mixtures,

Some call them the new town criers,

Others call them cock-eyed liars!"

And now that we have taken some of the skin off of poor old Mr. Business Man, let's look at the other side of the question for a little while. Let us digress for a moment to give you a glimpse of the picture as I have seen it of the conditions with which he has had to deal.

At the out-set I should like to say that American businessmen, as a whole, are to be highly commended and complimented for the ideals and the ethics they have maintained, in the face of the circumstances that have confronted them during recent years.

Businessmen and their methods have possibly had more than a just amount of criticism. Loose thinking and loose tongues have spread unjustified propaganda which has done incalculable damage to many who in no way deserve it. Ill-advised and poorly phrased publicity from numerous sources of apparent authority has engendered and fostered hatreds and antagonisms that have retarded rather than encouraged mutual understanding, which is essential to confidence and a healthy growth.

I believe that businessmen collectively are subject to condemnation for *many* actions that to me are inexcusable. But when we think of him as an individual, struggling toward the conduct of a successful business, trying to meet his payroll, pay his rents and bills, or warding off possible financial disaster, we must realize that there are often extenuating circumstances which must soften our criticism and increase our tolerance.

A brief resume of some of the conditions of the times in which he has found himself, particularly during the past decade or so, provides him as an individual with a partial alibi. He has been confronted with a situation unusually aggravated by the increased problems of the recent depression over which he as an individual had no control, but which situation has had a powerful influence upon his actions. The past few years also have been difficult ones for the businessman, *not alone* because of the conditions that have caused inactivity of his production and stagnation of his turnover, but from a standpoint of determining what policy he should pursue in the everyday conduct of his business.

He has been between two fires, so to speak. On the one hand he has had to strive to keep the wheels turning, to use every means his ingenuity could devise to stimulate and to go after business lest his competitors take it away from him. He has seen those competitors use all the tricks of the trade to lure customers to their door. If he permitted those practices to continue unnoticed and unchallenged, they might mean a loss of business, or possibly financial disaster to him. Regardless of their ethics, or even in some cases, regardless of their illegality, he has had to fight fire with fire, either to engage in those same business practices himself or to see the fickle public patronize the other fellow.

On the other hand, if he resorted to those practices in self-defense, he also ran the risk of destroying that cherished and most valuable of all business assets, the confidence of a still intelligent part of his patronage, and their good will which is the product of sincerity and square dealing, and which is fundamentally essential to continued confidence and success.

In many lines there has not been enough business to go around. Everybody has been straining to keep up volume. Often the easiest way to do so has seemed to be by taking it away from the other fellow. Competition has been fierce, and by the use of nearly every device to attract trade locally and nationally, business standards and business ethics have suffered. The consumers' interests have been consequently neglected.

There is an old saying that a hungry dog knows no manners. During the depression I have seen many business concerns who, when business became lean, with their backlog of funds gradually melting away, adopt and use methods which they formerly abhorred, and which at one time they would have never considered. In better times they would have complained bitterly at similar infractions on the part of their competitors. A few saw their business slip from under them, preferring to see it die and pass through the channels of liquidation rather than to resort to the tricks which their conscience and their sense of fair play would not permit them to use.

Let's have a look at the public with which he has had to deal. We have seen an alarming change in the morale and the apparent intelligence of great masses of our people. Under the stress of business stagnation and unemployment, this becomes manifest to a greater, if not an exaggerated degree. We have seen some of them abuse their creditors because those creditors have had the temerity to ask that bills for merchandise and services rendered be paid. We have seen great masses of our people following catchpenny schemes of the unscrupulous promoter, deceptive puzzle contests where an apparently large sum of money is available to the correct solution of a simple puzzle—which loose-conscienced publishers have seen fit to publish, generally at a little higher advertising rate. Chain selling schemes where housewives have been encouraged to pester their friends and neighbors to buy everything from billfolds to memberships to cathartic pills and Christmas trees, and in turn to resell to *their* friends and neighbors in an endless and increasing chain, in the hopes that when the chain is finally completed and their name progresses to the top of the list, there is wealth for everybody, except of course, the poor promoter who is furnishing the ideas and the merchandise, *just* to help his fellow men.

We have seen organized minorities stop production lines and destroy the properties of those who previously had provided the opportunity for them to earn a respectable and honest livelihood. We have seen those same organized minorities, obviously misled and misinformed by racketeers, prevent still greater numbers of their fellow men from continuing the work which they desired to do, and such interference ignored by weak-kneed governments controlled by political nincompoops who were afraid of destroying enough votes to defeat them and thus prevent their continuing to feed at the public trough.

We have seen our hotels, our taverns, our Pullman trains and others who cater to the public, struggle with the problems of large losses through the petty thievery of their customers and guests who take

almost everything that is not nailed down—ashtrays, glassware, silverware, towels, bedspreads, bathmats, and undoubtedly the carpets, mattresses and furniture would not be safe if it were not too difficult to remove them.

Hundreds of thousands of dollars are thus taken yearly by presumably perfectly respectable citizens, most of them thinking it is a good joke to take such items for "souvenirs." We have seen this same group struggle with the problem of the prolific and inexcusably careless cigarette smoker who has no thought for the rights of others, and no respect for their property. Millions of dollars of damage is done yearly in public places and private homes through the burning of expensive rugs, bedclothes, marring of furniture surfaces, starting of forest and grass fires through careless and inexcusable flipping of matches and lighted cigarettes.

We have seen great masses of our people following political pied pipers who have seemed to do their air castle designing and building for them in a bigger and better way. With a gullibility that sometimes seems more than childish, they have swallowed hook, line and sinker the conclusion that only enough votes for one of these political charlatans will provide pension or welfare legislation that would mean comfort, ease, and freedom from work or worry for the rest of their natural lives.

I'll admit, gentlemen, that this is a sorry picture to display before you, but it has been, and still is to a greater extent than we like to believe, a grim and disturbing reality that we can find such actions and conditions so widespread in our country. These people are not all loafers and hoboes. They are all too often people with whom the business man has had to deal. Unconsciously perhaps much of this type of loose thinking, selfishness and disrespect for the rights of others, has crept into business, so that a vicious circle of unsound and unfair practices have arisen to plague and to harass the sound thinking, conservative, strictly honest business man. Undoubtedly this condition has accounted for many of the practices for which he has been criticised.

There was a time when the rule of the sale, socially, commercially, and legally was caveat emptor, or in other words, let the buyer beware. We think of them as the old David Harum horse trading days when the buyer matched wits against the seller, and the one who would get the best end of the bargain was looked up to in the community as a shrewd and successful business man. The one who got the worst end of the deal, regardless of whether or not he was a victim of misrepresentation or foul play in the transaction, received no sympathy, either from business, from the public or from the law. He bought at his own peril, and if he was not shrewd enough to take care of himself, it was his own hard luck.

In those days, the subject of ethics was looked upon as a copy book maxim, and the proponet of any such ideals as applied to the sale, or in the conduct of business, was regarded as a fool-hardy reformer. We are thankful, however, that such opinions have changed.

We are glad those who believed, or do believe, ethics in business to be a mere copy book maxim, are gradually being replaced by giants of the commercial world who believe that ethics have a practical application to the every day conduct of business. They are men who believe that truth in business is the elemental basis of right action, that it is not a mere sentiment, but a practical rule for efficient, successful opera-

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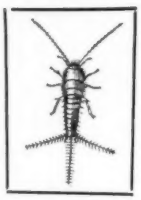

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Per-Mo Rat and Mice Exterminating Liquid can be used as a drink or can be mixed with any food and used as a bait.

Economical to use and a "Guaranteed" Rodent Exterminator.

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PER-MO MOTHPROOFING LIQUID FOR GUARANTEED SERVICE

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tion. It was Elbert Hubbard who said that, "One of the greatest discoveries of our age is that truth is an asset and lie is a liability." We might also say another great discovery is that business cannot be secured and maintained without the good will of the public; that good will cannot be secured and maintained without their confidence, and that their confidence cannot be secured and maintained without eternally and everlastingly telling the truth, both in your advertising and in your sales policies. While I am sorry to say there is still room for much improvement in modern business, and that we still have with us a ragged fringe of business men of the old school who believe the best method to get business is by sharp practice, however, on the whole today, it is not a question of simple honesty or dishonesty. In spite of the most sorry and disagreeable picture I have presented, the average business man of whatever occupation, is fundamentally honest. If we take into consideration the vast volume of commercial transactions that are taking place, I do not believe over one-half of one per cent, even if that much, could be said to be actually and intentionally dishonest. I believe it would be more correct to say it is a question of the practical technique of honesty, a matter of accuracy and fair play, rather than *truth* in advertising, or *truthful* representation.

During the past two decades there has come about in business a standardization of the rules of ethical conduct, of the descriptive terms; of procedures and practices, so that confusion and ambiguity are being eliminated. Prior to approximately two decades ago there were very few standards of practice or of procedure in business. We had them in the professions of medicine and law, and in engineering; the so-called ethics of the professions; but in business we had a very strong individualistic tendency in which men made their own rules applicable to themselves. There was a spirit of suspicion that caused many business houses to stand alone; to maintain what they called their "independence of action." There was that divine right and a spirit of public be damned. Such a spirit in business did not, at that time, nor does it at this time, make for progress, but rather for stagnation. Individualism, which hesitated to do anything in common for fear that a hated competitor might be helped thereby, only served to make business more localized, more dependent and less progressive. Until recent times there was very little in this country of associations of business executives whereby they could meet with each other and learn each others ideals, problems and methods. Only engineers, medical men, lawyers, and such, were organized with professional standards worked out for the common end or their mutual benefits. There were no such things as associations or purchasing agents, office managers, credit men, etc. Executives did not meet together themselves, and usually they forbade their employees to meet for fear they disclose something that might help another concern or a competitor.

It was not until some five or ten years preceding the great war that there was a gradual break-down in this narrow-minded business folly of individualism. One of the pioneers in the functional trade organization groups was The Associated Advertising Clubs of the World, organized to study, and to cooperate in the betterment of advertising. Out of this group grew the National Vigilance Committee, and later the Better Business Bureaus, which have since grown sufficiently large to separate themselves, and have now spread from one end of the country to the other in some 60 of the principal cities, financed with hundreds of thousands of dollars, and saving millions of dollars to the public in the prevention and curbing of fraudulent representation, and the curbing of unfair competition. One of the first sets of standards formulated and adopted for practical use were the advertising standards adopted by the Associated Advertising Clubs of the World. Since this advertising code, which was drawn up at a national conference, the Better Business Bureaus have been leaders in the promulgation and enforcement of practical standards. Many other organizations have been operating along different lines, but with the same common object in view. The Service Clubs, Rotary Clubs, Lions Clubs, Kiwanis, Exchange, Gyro, Mercator, Advertising, and other luncheon clubs have all had their business ethics and business standards committees, and much splendid work has been done inculcating the proper ideals and ethical standards into the business thought of their members.

Along with these organizations have come about the formation of trade associations, in nearly every line of business. These associations have been aggressive factors in remedying trade abuses within their own lines, cooperating to rid themselves of practices that are detrimental to their mutual welfare, and to the welfare of their industry. These associations in turn have adopted specific codes and definite standards that go to the very root and fibre of their various lines of business. These codes have laid down rules for fair play among themselves, as well as for fair treatment of their customers and the public, and also have tended to standardize their activities so as to increase their business efficiency.

The guiding thought seems to have been, the getting rid of those business barnacles of improper conduct that have tended to hinder the smoothe forward progress towards efficiency and prosperity.

One of our greatest technicians of industry and economics, has said that the most outstanding fact and development of American business in recent years has been the widespread efforts of business men to agree upon and enforce codes of ethics and standards of practice. Its greatest significance has not as yet been fully grasped. Its accomplishments and its effects are revolutionary. While competition is no doubt today, as it has always been, a religion and an instinct, this competition today is no less exciting, no less relentless or energetic; yet through organization and through standardization in his rules of conduct, the same as in his product that he manufactures or distributes, he has become, or is rapidly becoming, a part of a great well-oiled business aggregation. Where at one time, as an individual, he was playing a game single-handed, he is today a unit of a great team, playing his part under the rules of the game and winning, in accordance with his knowledge and use of those rules.

It is easier to be straightforward than to be crooked. It takes less time and less energy. It is far easier to tell the truth than to tell lies and then keep them covered up so as not to be found out.

The business man of today is gradually applying the rules of sportsmanship, honesty, and accuracy, with a result that business is in a new era, an era which will make business more profitable, make it less risky and will make for fewer panics or fluctuations. There was a time when railway rebates were common.

Today they are prison offenses, and the public has greatly profited. Commercial bribery has, to some extent, been eliminated and the time will come when it will be definitely eradicated. The evils of returned merchandise, bad credit, substitution, and such, will gradually be curbed. There is no reason why all

business cannot be conducted under standards of right practice that will bring about the confidence among business men that is obtained and enjoyed among the members of our great stock and grain exchanges. In these exchanges, millions of dollars are transferred and change hands simply by the nod of the head, or through the instructions of a recognized voice over the telephone. The writing of documents is too slow, too crude and would make impossible the tremendous amount of business that is daily transacted. In these places through the codes that have been adopted, bankruptcy and poverty are infinitely to be preferred to the breaking of your word among your business associates. Not because it is more noble, or more beautiful, or more ethical, all of which it may be, but because, as a practical business matter, the breaking of your word is ruinous to yourself and incompatible with your surroundings.

When a trader in Chicago Wheat Pit raises his head or nods his head as an order for a million dollars worth of a certain specific goods grade of wheat, and his order is taken, it represents a triumph in the standardization of business conduct. He has passed no money, has made no expensive examination of the wheat, the broker's word is enough. The standard grading of that wheat is assured. Each of them knows precisely what the other expects, and each will get exactly what he expects. Each bushel of that wheat will be, and must be, up to the grade set. Its condition will be correct, its disposition safe, the order authentic, time of delivery understood, the money in the bank to pay for it. When not only wheat transactions, but all business transactions, great and small, will be as simple and as standardized as this; when business representations made, the promise given, the order placed, the terms agreed to, the technical description clearly understood, the human relationship along the entire line from factory or field to final consumer is a clearly defined line of accomplished fair play, then the real goal of good business will be realized.

Fur Moth-Proofing

In order to hatch and destroy moth eggs lurking in stored furs, an Oregon storage plant sets the temperature at 33 degrees Fahrenheit for 14 days, then 60 degrees for six days, then drops to zero for one day.

—*Science News Letter.*

Ferrets Give Truck Driver Headache—Chickens the Jitters—and Police a Merry Chase

Much ado was caused by six ferrets, according to a news item in the N. Y. Times. It seems a crate of ferrets consigned to the laboratories of the Cornell University Medical College at the East Side Medical Center in N. Y. C. was placed aboard the same truck with a crate or two of chickens and ducks. That, we think, was putting a premium on temptation and it wasn't long before the baser nature of the ferrets asserted itself. Breaking out of their crate, they made for the chickens and the ducks, giving them a first class case of the jitters, which naturally they did not suffer in silence. Up front our truck driver friend was driving along minding his own business and watching the traffic lights, when the melee within attracted his attention. Turning to see what it was all about he was appalled by such goings on. Being a man of action, he broke all speed records and soon arrived with his strange cargo at police headquarters seeking assistance. After much travail and the use of nets on the part of the police, the frustrated sextet was placed in a wire cage usually used for mad dogs and was soon on its way to its appointed destination and the chickens and ducks, who, we understand, later turned up in the guise of salads or chicken a la king at a local restaurant. Proving all's well that ends well.

Stop TERMITE DAMAGE with CHIPMAN DRY SODIUM ARSENITE

● Stops and prevents termite entrance into buildings from parent soil colony. Used for treating foundation timbers, infested beams and sills. Also protects unpainted woodwork. Completely soluble in cold water. May be used in original dry form.

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114 East 32nd Street, New York City.

Elm Leaf Beetle

By CHARLES H. BLAKE, *Massachusetts Institute of Technology, Cambridge, Mass.*

SO MANY inquiries on the Elm Leaf Beetle (**Galerucella xanthomelaena**) come in from P.C.O.'s and from the public that an account of its habits should be useful. The essential dates are presented in the calendar. This beetle is now found in northeastern America to Michigan and Tennessee and in the Northwest.

Jan.	Beetles in winter quarters (in houses, etc.)
Feb.	
Mar.	
Apr.	
May	Beetles leaving winter quarters and flying about outdoors.
	Eggs on leaves of elms.
June	Grubs feeding on the leaves.
July	Pupae at bases of elms.
Aug.	Beetles flying outdoors. Some eggs may be laid. A few grubs and pupae.
Sep.	
Oct.	Beetles in winter quarters.
Nov.	
Dec.	

1. Calendar of the Elm Leaf Beetle.

Some of the adults emerging in midsummer lay eggs and start a small second generation but most of them do not lay until the following spring. This beetle is remarkably early in seeking its winter quarters. In towns these are in the cooler parts of houses, such as attics or spaces within the walls. This fall invasion is spread over everal weeks and may be almost unnoticed but the spring exit occurs more suddenly and great numbers of the beetles may be found at windows, trying to get out.

Indoors, these beetles are merely a nuisance to be disposed of by any convenient method. For the sake of the elms, kill them; don't just let them out. Outdoors, they are a major pest of elms. The foliage should be sprayed with lead arsenate in early June. Both grubs and adults feed on the leaves, shredding them and even defoliating the trees. The pupae are to be found in the grass at the bases of the trees and may be killed by spraying there with nicotine-soap during late July. I anticipate an unusually large number of the beetles in New England in the spring of 1941.

Formulae

1. Against grubs
   Lead arsenate ..... 5 lbs.
   Water ..... 100 gals.
2. Against pupae
   Nicotine sulphate ..... 1 qt.
   Laundry soap ..... 4 lbs.
   Water ..... 100 gals.

The best references are: Conn. Agric. Exper. Sta., bull. 155 (1912) and U. S. D. A., leaflet 184 (1939).

Families in Four Homes Flee Fire

E. Sixth Street Blaze Causes $1100 Damage

More than a dozen Negro families fled to to safety early Friday when fire following an explosion badly damaged four homes on E. Sixth street, near Court street, Marshal Leo Kuhn reported.

Patrolman Harold Freytag and Harry Hull aroused a number of the families and aided several persons to the street.

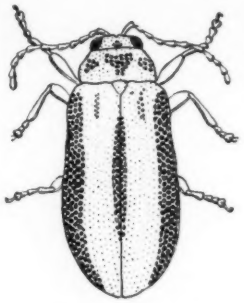
Marshall Kuhn said the blaze started in the apartment of Mrs. Pinkey Edmondson, 684 E. Sixth street, where the explosion blew out part of the rear of the building. The family was not at the home, which was being fumigated with a mixture of gasoline and moth balls, he said.

The fire spread to adjoining dwellings at 682, 686 and 688 E. Sixth street. Marshal Kuhn estimated damage at $1100.

Mrs. Ruth Dunne, 19, daughter of Mrs. Edmondson, fainted when she saw the damage caused by the fire and was revived by the Life Squad.

The young man who works his way through college has an invisible degree that is too precious to be given by human hands, too sacred to be scrolled on a sheep-skin.

—Anderson M. Baten.



2. Adult Elm Leaf Beetle: Length about 1/4 inch, color greenish buff with blackish stripes.

Mutual Aid

CHARLES H. BLAKE, *Massachusetts Institute of Technology, Cambridge, Mass.*

Following up my notes on ants, I will be glad to identify ants of economic significance. Ants should be put, alive or freshly sprayed, into rubbing alcohol or other alcohol of about 70% strength, in tightly corked vials. The date and place of capture (town and state) should be attached to the vial together with a number in case there is more than one vial and additional information comes by letter. Don't mix nests; put specimens from separate nests in separate vials, even if the ants look alike. Please send more rather than fewer specimens because some ants are not identifiable from one or two examples. If the ants are swarming, try to trace them back to the nest and get workers as well as winged forms. It may well be that some kinds will have to be named by other entomologists and the only reward I can offer a fellow scientist is a share of the specimens. If the above directions are followed the material will have scientific value.

Toxoplasma

David Dietz, Scripps-Howard Science Editor recounts in his column of the discovery of a new human disease caused by an organism previously believed to attack only the lower animals by two St. Louis physicians.

The disease closely resembles Rocky Mountain spotted fever and, like that disease, is believed to be transmitted by the bite of insects, in all probability the tick which also transmits spotted fever. There is some possibility, however, that mosquitoes may carry it.

The infecting organism is known as the toxoplasma. The two physicians, Dr. Henry Pinkerton and Dr. Richard G. Henderson, report two fatal cases of toxoplasma in a recent issue of the Journal of the American Medical Association.

Methods of Testing Insecticides

(Continued from Page 13)

spraying operations on crawling insects. What is considered an adequate coverage per unit area of surface? We know that we can kill roaches and bedbugs with base-oil alone by spraying enough of it on them, but we suspect that such a dosage would be objectionable in practice, and for that reason toxic ingredients must be added to the base oil so that control can be obtained with a lower dosage of liquid. What is a reasonable dosage? If we knew the answers to the foregoing questions we would be in a better position to recommend laboratory methods for evaluating roach and bedbug sprays.

Ants Won't Eat "Bread"—So They're Fed "Cake"

Recent newspaper items state two years ago Dr. Raymond L. Ditmars, Curator of Reptiles and Insects, Bronx Zoo, New York, brought a few hundred of the parasol ants back from Trinidad, starting the nucleus of a present thriving colony of 10,000, one of the zoo's most popular exhibits.

The ants refused to eat anything but hothouse roses, of which they consumed a dozen a day. This was all right until the price of roses went up to 90 cents a dozen.

Being of an economical turn of mind, Dr. Ditmars made a deal with a florist to supply him with fallen petals and leaf trimings from roses. The ants did not "cotton" to this at all. They refused to eat and started chewing up each other. At the end of the first night 1,000 of them were quite dead.

Dr. Ditmars relented and ordered the expensive bouquets put back on the "table" as a part of the ant diet—not a decoration, of course. Proving that a rose in any form doesn't taste so good—at least that's what the ants seem to think, anyway. However, refusing to take any more chances on ant temperament, he sent to Trinidad for another colony to hold in reserve.

I joked about every prominent man of my time, but I never met a man I didn't like. I'm proud of that.—Will Rogers.

LOCAL ORGANIZATION NEWS

New England Pest Control Association

It is too late to give details about the regular meeting of the New England Pest Control Association which was held at Hotel Lenox, Boston, Mass., Monday, March 24th.

The guest speaker was F. Kenneth Harder of Hempstead, New York, who spoke on his favorite subject of "Termites." At the April meeting it is expected that Secretary "Bill" Buettner of National Pest Control Association will be the speaker.

New Jersey Pest Control Association

Ernest M. Mills of the Predator and Rodent Control Division of the Fish and Wildlife Service of the Department of Interior completed an interesting series of lectures and discussion sessions at the regular meeting of the New Jersey Pest Control Association held at 1060 Broad St., Newark, N. J., March 25th. The concluding lecture dealt with various economic poisons, formula and relative merits of the toxics used. At the conclusion of the meeting, in appreciation of the splendid co-operation given by Mr. Mills, a brief case was presented to him. J. Edwin Sameth of the Western Exterminator Company who graciously permitted the use of his office for the meetings was also presented with a gift.

The New Jersey Pest Control Association adopted a resolution that requests an appropriation being granted by Congress to the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture for additional research of household and structural pests.

The two-reel motion picture, "Insect Enemies of Man," was shown through the courtesy of Henry Turrie of Milwaukee, Wisc.

William C. Blake, Princeton, N. J., and secretary of the New Jersey Health Officers Association, spoke briefly on the subject of rodent control and the need for campaigns of some kind where there are reported infestations. William O. Buettner, secretary of the National Pest Control Association, commented briefly about the meeting of the American Public Health Association that is to take place in Atlantic City and at which the National Pest Control Association is to have an exhibit. It is expected that the New Jersey Pest Control Association will participate.

Among those present were: J. L. Geisman, Sanitary Exterminating Co., Jersey City; F. A. Klein, Hudson Exterminating Co., West New York; S. N. Sadoff. Hudson Exterminating Co., West New York; H. Krauss, American Exterminating Co., Newark; Matthew Harwin, Vermetox Laboratories, Newark; Max Harwin, Vermetox Laboratories, Newark; M. Breecher, Federal Exterminating Co., Jersey City; M. J. Schatzberg, S. & S. Exterminating Co., Union City; J. K. Medoff, Hudson Exterminating Co., West New York; Wm. Waack, North Jersey Exterminating Co., Union City; F. J. Eagan, North Jersey Exterminating Co., Union City; Wm. Bancale, North Jersey Exterminating Co., Union City; William C. Blake, Department of Health, Princeton: J. T. Boone, American Cyanamia, New York City; J. E. Sameth, Western Exterminator Co., Inc., Newark; W. J. Young, Jr., Department of Health, Princeton; W. O. Buettner, N. P. C. A., Brooklyn; and Ernest M. Mills, Predator & Rodent Control Division, Fish & Wildlife Service, U. S. Department of Interior.

Professional Exterminators Association

Joseph Finneman, President of The Professional Exterminators' Assn., of New York City, held its regular monthly meeting on February 10th last, at the Hotel Commodore. Meetings are held on the second Monday of each month at the Commodore.

Connecticut Pest Control Association

The Connecticut Pest Control Association held its regular monthly meeting Feb. 18th, at the Connnecticut Experimental Station.

A number of important matters were discussed, among them the past conference at the Massachusetts State College in Jan-

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uary. The Connecticut Pest Control Association was well represented at this conference. Those attending were Messrs. J. VanSloat, Walker Heap, Fred Haas, F. E. Bohman, T. J. Ledwith, and Neely Turner of the Connecticut Experimental Station who, by the way, gave a very interesting lecture on termite control. Another item discussed at this meeting was a letter, in pamphlet form, which when finished will be distributed to the various health officers in the State of Connecticut.

Indiana P.C.O.'s Meet

The regular bi-monthly meeting of the Indiana Pest Control Operators' Association met in the Union Building of Purdue University, Saturday, March 15.

G. E. Gould discussed recent books and literature of interest to pest control operators. A general discussion of the subject "Making Sales," was participated in by all present. Bert Lewis exhibited a piece of equipment which he had developed for use in cleaning cracks and crevices in connection with carpet beetle control. J. J. Davis reported on the four regional P.C.O. conferences. Lively and interesting discussions were held on several problems, with emphasis on the insecticide and pest control operator laws which were introduced into the Indiana State Legislature. Neither of the bills became laws.

Officers for the ensuing year were elected as follows: President, Maurice Bailie, South Bend; Vice-President, Ed Arnott, Indianapolis; Secretary-Treasurer, C. O. Partlow, Lafayette; Board of Directors, J. R. Franklin, Hammond; Bert Lewis, Muncie; and E. E. Edwards, Indianapolis.

California Pest Control Association, Inc.

The California Pest Control Association has been unusually busy the last few weeks and in part the members are getting back into the stride of a heavy business season after a most successful state convention, as well as the Fourth Annual P.C.O. Conference.

There are, however, a few notes that are worthy of comment.

DISTRICT 6

Held a dinner meeting in February at Dad Alderman's place in Berkeley with 14 present. Bill Hoffman, legislative representative of the Associated Sportsmen of California was guest of the evening.

Members of District 6 have recently completed a door to door canvass of all licensed operators in the East Bay Region, securing names on a petition to indicate preference of the industry toward a single owner-operator license. Latest reports show nearly a 100% sign-up.

Other News Items of Interest

Mr. L. R. Alderman has been retained as legislative chairman for the coming year. The committee members will be, in addition to the chairman: L. W. Christensen, E. A. French, C. P. Cain, E. T. Auger, W. K. Davis and David B. Castle. This is the same committee that has done such effective work this past year.

Jess Miller has been appointed chairman of the Ways and Means Committee.

A. T. Parsons has been retained as chairman of the committee on Constitution and By-Laws.

Ladies' Auxiliary

This is the first and only state wide ladies' auxiliary to any pest control organization.

Wayne K. Davis has been appointed to carry on the editorial work on the California Pest Control Monthly for the coming year.

It was tentatively promised that a pest control representative would be placed on the program of the Real Estate Convention in Fresno this summer.

The Associated Pest Control Operators, Inc., of Los Angeles, Calif.

Notice was received of the monthly meeting at Eaton's Chicken House, Wednesday, March 12, 1941. The usual arrangement of dinner at 7:00 P.M., followed by the regular meeting took up for discussion Assembly Bill 1057 and Kalotermes.

Unfortunately no details of the meeting are forthcoming at this writing.

Entomological Literature

FARMER'S BULLETIN 1533 RAT CONTROL

Detailed instructions for preparing and distributing red-squill baits and for gassing, trapping and otherwise controlling rats discussed.

FARMER'S BULLETIN 1638—RAT-PROOFING BUILDINGS AND PREMISES

Rat Control, and methods of shutting rats out of buildings described.

Bulletins 1533 and 1638 are available, free of charge, so long as the supply lasts, from the Office of the Fish and Wildlife Service, U. S. Dept. of the Interior, Washington, D. C.

THE HOUSE RAT

By James Silver

Wildlife Circular 6 issued by the U. S. Dept. of the Interior, Fish and Wildlife Service. Contents: A public menace; classification; introduction and spread; breeding and other habits; abundance economic status, destruction of food and other property, appalling annual losses; Relation to Health, Bubonic plague, typhus fever, rat bite fever, food poisoning, tularemia, rabies, trichinosis, other rat borne diseases; rat utilization; repression of rats.

For sale by the Supt. of Documents, Washington, D. C., price 5 cents. (no stamps).

Are Soaps Germicidal?

January-Soap contains an article "Are Soaps Germicidal?" by Dr. E. G. Klarmann and Dr. V. A. Shternov. Readers desirous of obtaining a reprint of this interesting article can do so by addressing National Association of Insecticide and Disinfectant Manufacturers, Inc., 110 E. 42nd Street, New York City.

Southern Pest Control Operators' Conference 1941

Left to right: J. H. Roberts, T. C. Raley, A. Zimmern, E. R. Barber, O. W. Rosewall, L. Kotler.

LOUISANA MEETS TEXAS
E. R. Barber and H. O. Abel

Left to right: J. Mandlebaum, J. G. Benschoter, L. S. Bridges, H. O. Abel, J. Kilmartin.

WHAT'S NEW IN PEST CONTROL-PERSONALS

DR. P. H. KAHL

Dr. Kahl, 81, entomologist at Carnegie Museum for 40 years and a noted authority on several insect families, died at his home in Pittsburgh during February. Though an American citizen, Dr. Kahl was Swedish-born. He had been accorded honors abroad and in this country for his outstanding accomplishments. Dr. Kahl evinced a great interest in the work of the Pittsburgh P.C.O.'s and always stood ready to assist in their problems.

TOM McGRATH PASSES

Sad word reaches us of the tragic death of Tom McGrath, Fumigant Inspector of Newark Health Dept., Newark, N. J., who suffered a severe heart attack at dinner recently and died almost immediately.

Tom was a specialist in the fumigation field and in general sanitation matter. He leaves besides his widow, four young children. We join with the industry in extending our sincere condolences to his family.

WE MOURN A YOUNG READER

With a strange feeling in the throat we announce the accidental death, on March 14, of Richard Cortis of Worcester, Mass.

He was a regular and devoted reader of this magazine; his parents say it was his favorite. His chief interest was in "the pictures"—for Dickie was only three.

Our affectionate sympathy is tendered to the parents, Mr. and Mrs. Chester M. Cortis, C. M. Cortis Chemical Co.

Guarantee Exterminating Co., Division of Guaranteed Sanitation Co., Inc., N. Y., had a booth at the New York Flower Show held at Grand Central Place during March. Considerable interest on the part of the public was manifested in the termite control theme featured at the Guarantee booth.

OLIE, THE CAT, RAISES OWN FOOD SUPPLY

Word comes from Ashtabula, Ohio, that Olie, a large tiger-striped cat, has adopted two baby rats into her family of two kittens. The four nurslings play and feed together.

Olie can now litter-ally meow that she has a couple rats in her family.

The next annual meeting of The National Sanitary Supply Association will be held at the New Hotel Jefferson, St. Louis, April 21 to 23.

John Powell, head of John Powell & Co., N. Y., was operated on for a hernia at the Mountainside Hospital, Montclair, N. J., Feb. 28. Mr. Powell, also treasurer of the N.A.I.D.M. for many years, was first stricken in Mexico City and flew back from that city to have the operation performed. We are pleased to report he is doing nicely and will be up and around at his usual "top speed."

The American Chemical Society will hold its 101st meeting in St. Louis, Mo., from April 7 to 11.

Walter Winchell's definition of a "Broadway Wiseguy": "He's the kind of a fellow who believes there is a gimmick or a catch to everything, and when you send him a Christmas card he quickly turns it to see if there's an exterminator's ad on the back."

Far be it from us to try and outscoop America's No. 1 news scooper, but someone ought to inform Mrs. Winchells' boy Walter that the exterminator has been known as a P.C.O. for some time past now.

New Government Bulletins of Interest to P.C.O.

The Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, Washington, D. C., has issued a series of mimeographed circulars on "Insects in Relation to National Defense," which should be of considerable importance to pest control operators. They are as follows:

Introduction	Circular 1
Termites	Circular 2
Fabric Insects	Circular 3
Food Insects	Circular 4
Meat and Animal Product Insects	Circular 5
Powder-Post Beetles	Circular 6
Mosquitoes	Circular 7
Flies	Circular 8
Lice	Circular 9
Bedbugs	Circular 10
Cockroaches	Circular 11
Ticks	Circular 12
Fleas	Circular 13
Chiggers	Circular 14
Ants, Wasps and Other Insects	Circular 15
Horse Bots	Circular 16
Stable Flies	Circular 17
Screwworms	Circular 18
Livestock Insects	Circular 19
Devices for Insect Control	Circular 20
Insecticides and Subsidiary Materials	Circular 21
Fumigation	Circular 22
Reference Index	Circular 23

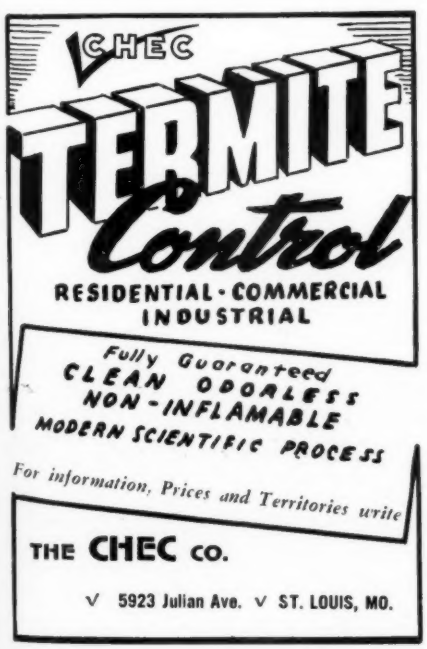
Additional Patents Relating to Pest Control

By Dr. R. C. Roark

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculaure assumes no responsibility for the merits or workableness of of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,217,612 (Oct. 8, 1940; appl. Dec. 27, 1939). TERPENE-CYANOCYL COMPOUND AND METHOD OF PRODUCING SAME. Joseph N. Borglin, Wilmington, Del. —Hercules Powder Company, Wilmington, Del.—The patentee claims a terpene compound having the type formula ROOCR1 XCN in which R is a hydroterpinyl radical, R's is a radical selected from the group consisting of aliphatic and aromatic radicals, and X is a member of the group consisting of sulfur, selenium, and tellurium. Examples are hydroterpinyl thiocyanoacetate and hydroterpinyl thiocyanibutyrate. The compounds according to this invention are useful in insecticides. For example, they may be used in kerosene solution in a concentration between about 0.5% and about 20% with or without other toxic agents such as pyrethrum and rotenone, as contact spray insecticides, or in emulsions, or on solid carriers.

2,217,613 (Oct. 8, 1940; appl. Dec. 27, 1939). TERPENE-CYANOACYL COMPOUND AND METHOD OF PRODUCING SAME. Joseph N. Borglin, Wilmington, Del. —Hercules Powder Company, Wilmington, Del.—The patentee claims a new terpene compound having the type formula ROOCR'-



XCN in which R is a radical of a terpene tertiary alcohol, R' is a radical selected from the group consisting of aliphatic and aromatic radicals, and X is a member of the group consisting of sulfur, selenium, and tellurium. An example is a terpinyl thiocyanobutyrate.

2,217,673 (Oct. 15, 1940; appl. Sept. 22, 1939). INSECTICIDE. Gerald H. Coleman and Clarence L. Moyle, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—An insecticidal composition comprises as a toxic ingredient an ester having the following formula: XOC(O)-R—C(O)OX, wherein R represents hydrocarbon residue selected from the group consisting of the aromatic, aliphatic, and cycloaliphatic radicals and X is selected from the class consisting of the allyl and 2-chloroallyl radicals.

2,218,181 (Oct. 15, 1940; appl. June 15, 1939). PEST CONTROL. Norman E. Searle and Wendell H. Tisdale, Wilmington, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—A pest-control composition contains as an essential active ingredient a di-ester of an aliphatic monohydric alcohol and a butenedioic acid.

2,218,403 (Oct. 15, 1940; appl. May 24, 1939). ELECTROCUTING TRAP. Roy McKee, Tulsa, Okla.—This electrocuting trap is particularly adapted for electrocuting mice.

2,218,860 (Oct. 22, 1940; appl. Oct. 31, 1939). SPRAYER. Myron H. Smith, New Hartford, N. Y.—D. B. Smith & Company, Inc., Utica, N. Y.—A portable hand-operated continuous sprayer is described.

2,219,403 (Oct. 29, 1940; appl. Oct. 9, 1939). INSECTICIDE PACKAGE. Ferdinand W. Sennewald, St. Louis, Mo.

2,219,858 (Oct. 29, 1940; appl. Aug. 16, 1939; in Germany, March 22, 1937). PYRIMIDINE COMPOUND. Kurt Westphal, Wuppertal-Vohwinkel, Germany. — Winthrop Chemical Company, Inc., N. Y.—The patentee claims 2-halogen-pyrimidines bearing in the 4-position a dimethyl-amino group and in the 6-position a methyl radical, the halogen atoms being selected from the group consisting of chlorine and bromine. It has been found that these compounds are particularly well suited for killing rodents.

German Mosquitoes?

London.—Mosquitoes are infesting the subway air-raid shelters and many persons have been bitten severely, the medical publication, Lancet, reported.

—*New York World Telegram.*

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Our new 1941 brush catalog is now ready for distribution. We show the most complete line of brushes in the U. S., including floor brushes and miscellaneous items for the janitor trade. Ask for your copy of this big catalog today.

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36 page illustrated brochure which discusses Chloropicrin uses, advantages, safety, effectiveness, properties, methods of application, equipment, general fumigation, the sealing of the building, temperatures in fumigation, dosages in general fumigation, exposure, grain elevators, box car fumigation, rats and mice, comfort and safety of operator, controlling insect infestation, dosage schedule, etc.

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Circular describing realistic full size insect displays. Useful in developing consumer contacts.

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WRITE PESTS—Placard.

FUMIGATION SAFETY SUGGESTIONS

Bulletin discusses safe practices in the use of fumigants and the effects of certain fumigant products on painted walls, highly polished fixtures, also when and where to use as well as not to use.

WRITE PESTS—February-March.

MOUSE TRAP

Circular in which manufacturer claims no bait required, no blood or mutilation, automatic setting, no touching of mouse, rust proof metal construction.

WRITE PESTS—Run-Way.

PYRETHRUM - DERRIS - RED SQUILL PRODUCTS

Leaflet describes foregoing insecticides with special bait chart for use in connection with powdered red squill.

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WRITE PESTS—Cyanogas.

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By W. J. Haude, Entomologist

The object of this memorandum is to summarize for insecticide manufacturers and other interested persons some of the more important agricultural uses of rotenone-bearing insecticides. In all cases recommendations are based on those emanating from official state and federal experiment stations unless otherwise noted.

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With The Tox-Eol System

You use the same chemical for both ground and wood treatment.

Your cost for chemical and labor are both low.

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The Chemical Used

Is practically unaffected by normal heat nor moisture so it stays where you put it.

Leaves no stain—does not affect paint—has no persisting obnoxious odors.

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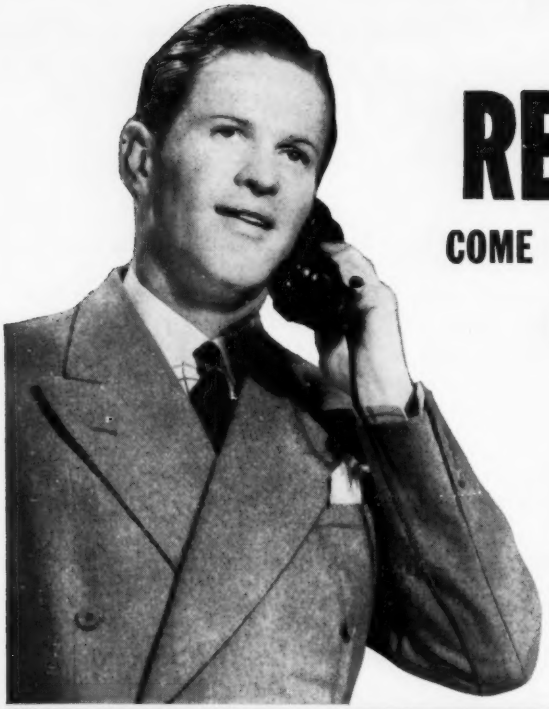

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